FIBER OPTIC
SYSTEM CATALOGUE LISA

Edition 2006/2007

HUBER+SUHNER

Excellence in Connectivity Solutions
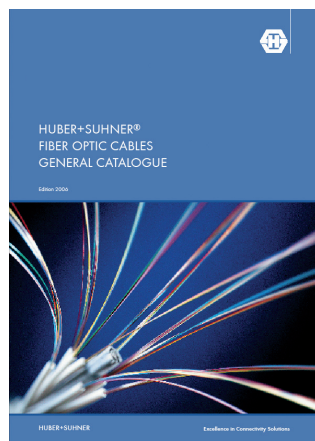
FURTHER FIBER OPTIC CATALOGUES
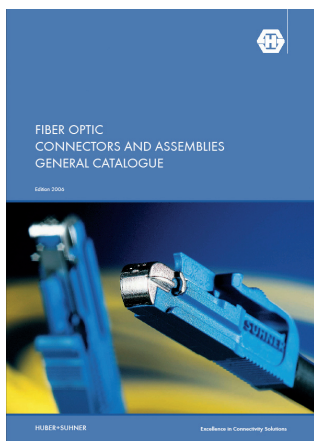
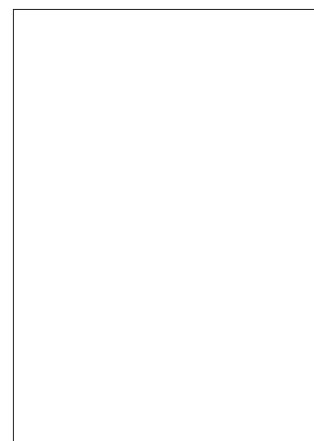Connectors and assemblies
Item no. 84019828

Cables
Item no. 84019826

Cabling systems
Item no. 23040188

Passive network components
Item no. 84019859

LISA – LEADING INTERCONNECT SYSTEMS APPROACH

OUR COMPANY

COMMUNICATION

Connections that enrich our lives
Our broad range of products and services make an essential contribution to set up and expand fixed-line and mobile communication networks. We offer radio frequency components and broadband antennas for all common standards, fiber optic cables, connectors and distribution systems for telecom and local networks. Coaxial cables, connectors for radio networks, test and measurement and lightning protection components are also available.

THE HUBER+SUHNER GROUP is a leading global supplier of components and systems for electrical and optical connectivity. Our customers in telecommunications, industrial applications and transportation appreciate that we are specialists with detailed knowledge of practical applications. We offer technical expertise in radio frequency technology, fiber optics, cables and polymers under one roof, thus providing a unique basis for continual innovation focused on the needs of our customers all over the world.

Our motto is: «EXCELLENCE IN CONNECTIVITY SOLUTIONS». At the heart of our offering is a broad range of products that can be relied on to meet high quality standards, backed up by flexible, dependable services with fast response times worldwide. We concentrate on complex applications that allow us to stand out by adding value with special product features, customer-specific innovations, engineering and other services.

TRANSPORTATION

Connections that get us moving

As one of Europe's leading suppliers, HUBER+SUHNER offers a wide range of products which provide the platform to build modern rail transport systems. These products are developed for high quality needs and are specifically designed for applications such as: train positioning with GPS, cellular distribution for mobile telephone access, WiFi distribution for on-train internet access, CCTV for video surveillance, passenger infotainment systems for real time passenger information and entertainment, OTMR for train diagnostics during operation, inter vehicle jumper systems and profiles for safety and comfort.

INDUSTRY

Connections that add value

Our components and system solutions are suitable for specialised applications in aviation, space, defense, and medical technology. Our products are superior, providing constant reliability even under extreme conditions: from copper cable to optical connections and high frequency components.

LISA SERVICES

Training
Several different product trainings are offered either held on-site or at HUBER+SUHNER premises. Trainings include theoretical and practical parts tailored in particular to the needs of installers, planners and network operators. Possible topics are LISA fiber management systems and splice closures.

Technical assistance
Our experienced technicians provide support before and during the installation of LISA products. With the aid of assembly instructions our technicians show how to handle LISA components directly on products to be installed.

Documentation
For comprehensive project documentaion the following high quality product documentation is available: data sheets, text for tenders, assembly instructions, labeling, test reports and presentations. Detailed and always updated information can be found on our homepage www.hubersuhner.com/lisa or at your local HUBER+SUHNER supplier.

LISA SERVICES
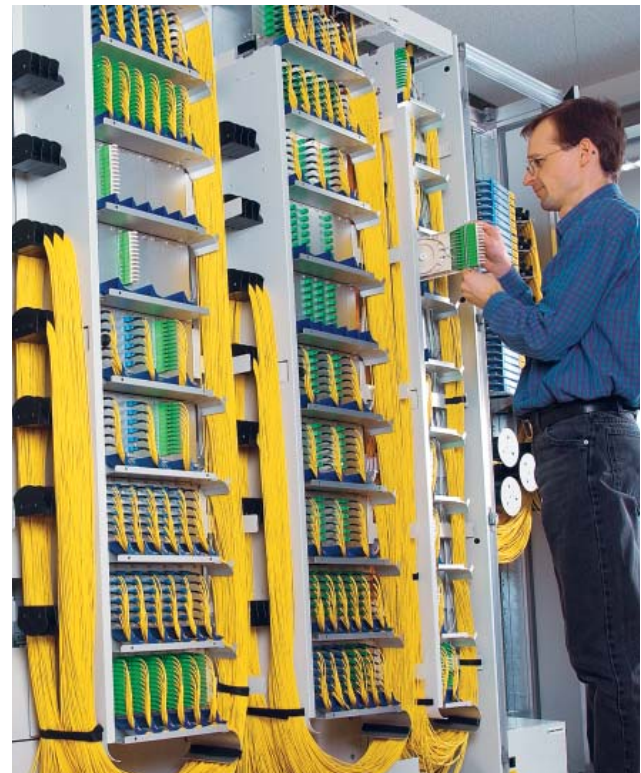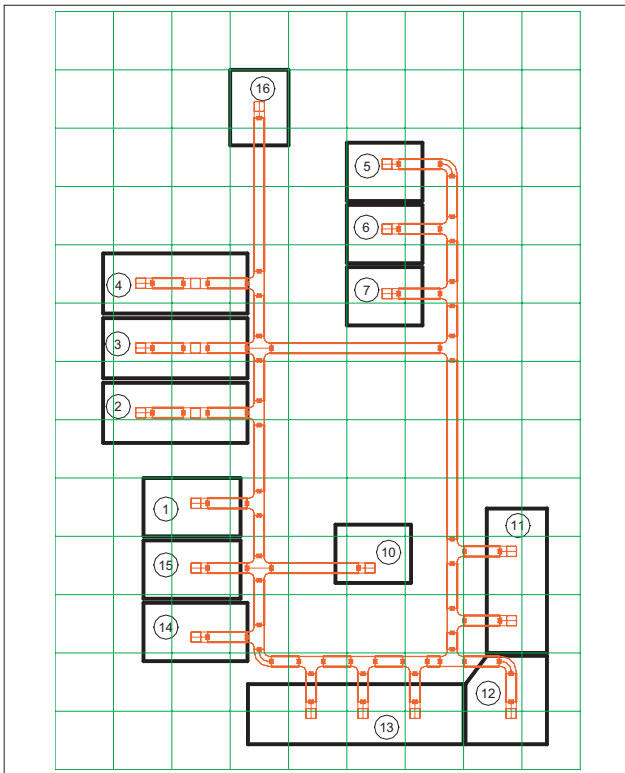
Layout engineering

In the area of central offices we offer extensive planning of optical distribution rack configurations, cabling concepts and cable ducting. When floor plans and connection requirements are supplied, HUBER+SUHNER can produce a detailed schematic using library building blocks and CAD layouts. In doing so, our aim is to produce the most economical and future proofed structure of fiberoptic networks, so that no unnecessary cross-routing occurs. Such a designed system saves costs and time during installation, expansion and maintenance. Our offer contains all required information such as part lists, suitable cable and patchcord lengths, detailed configurations of the optical distribution racks as well as ducting layouts.

System update

HUBER+SUHNER can assist customers with system renewals or upgrades. Every product within the LISA family has been developed to allow fast and simple integration into either existing network structures or new projects.

APPLICATION OVERVIEW

The LISA product range represents a modular group of products that enables seamless construction of SingleCircuit and MultiCircuit Passive Optical Networks. The flexibility of the basic system allows for complete and compatible system solutions in the following areas

WAN/MAN (Carrier networks) in
- central offices
- outside plant
- network termination

LAN (Customer premises resp. Enterprise networks)

Requirements of international telecom and carrier operators as well as of private enterprise companies have been considered in the LISA product design. Ideal solutions for different sites and various applications are offered with the wide and modular LISA product range. Modularity also ensures a gradual extention of networks.

LAN (customer premises)

Network termination

Outside plant

Central office

WAN – CENTRAL OFFICE

CENTRAL OFFICE – FRONTACCESS

Distribution racks
- frontal fiber position
- high fiber density per footprint
- standardized rack dimensions (ETS and 19")
- lateral and backside mounting of further racks
- 4 different rack types: ODR 300F / ODR 600F / ODR 900F / ODR 1200F
- rear-mounting of components within the ETS racks for improved access to fibers and cables
- clearly arranged and secure fiber, patchcord and cable management
- separation of incoming and outgoing fiber
- easy fiber access within patch field
- management for loose tube or pre-terminated cables
- continuous bending radius control. 35 mm for fiber and patchcord; 45 mm for loose tubes
- integration of standard and small form factor connectors
- up to 960 fibers per rack

Compact modules
- MultiCircuit management (MCM) and SingleCircuit management (SCM)
- versatile splice cassettes incl. book system functionality
- loose tube overlength storage within module
- easy access to vertically mounted modules
- easy installation and handling by one person only
- modules with passive optical components (e.g. splitters)

Integrated patchcord routing channel
- for patchcord routing to lateral and backside racks without additional, external ducting parts

CENTRAL OFFICE – SIDEACCESS

Distribution rack
- side facing fiber position for high laser safety
- high fiber density per footprint
- standardized rack dimensions (ETS)
- two different types: ODR 600S and ODR 900S
- rear-mounting of components within the ETS racks for improved access to fibers and cables
- fast installation from front side
- intelligent patchcord management
- separation of incoming and outgoing fiber
- management for loose tube or pre-terminated cables
- radius limitation of 30 mm for fibers and patchcords
- integration of standard and small form factor (SFF) connectors
- up to 960 fibers using standard and 1920 fibers using SFF connectors

Splice cassettes
- horizontal fiber tray offers high packing density
- intelligent hinge system on the trays for easy fiber access
- MultiCircuit fiber management
- passive optical device trays (e.g. splitter)
- coloured fiber trays for clear identification

Point-to-point cabling system
- tested and ready-for-use cabling system for fast installation without splicing
- pre-terminated trays and MASTERLINE breakout cables
- with robust pulling tube at MASTERLINE end for pulling through ducts/pipes

ODR – FRONTACCESS

General features for all racks

- modular and flexible systems
- MultiCircuit (MCM), SingleCircuit management (SCM) and a combination of both
- bending radius control throughout: 35 mm for fibers and patchcord; 45 mm for loose tubes
- management for loose tube or pre-terminated cables

- intelligent variants for storing, routing and cross-connecting fiber optic patchcords
- fast removal of side walls and doors
- easy installation and handling by one person only

Characteristics	ODR 300F	ODR 600F
dimensions (B×T×H)	300 × 300 × 2200 mm	600 × 300 × 2200 mm
type of subracks	300F	600F
max. number of subracks	10	10
max. number of breakout termination units	–	–
max. number of fibers with MCM with SCM	240 120	720 360

Features of ODR 300F/600F

- highest fiber density per footprint without compromising performance, reliability and ease of maintenance
- standardized rack dimensions (ETS)
- rear-mounting of components for optimal access to fibers and cables
- side-mounted patchcord management, pull-out style
- patchcord routing without external ducts to racks mounted side-by-side and back-to-back (ODR 300F to lateral racks only)

ODR – FRONTACCESS

Applications
- Telecoms
- CATV
- WAN/MAN (carrier networks)

Characteristics	ODR 900F	ODR 1200F
dimensions (B×T×H)	900 × 300 × 2200 mm	1200 × 300 × 2200 mm
type of subracks	900F	900F
max. number of subracks	10	10
max. number of breakout termination units	20*	20
max. number of fibers with MCM with SCM	960 480	960 480

* ODR 1200 recommended

Features of ODR 900F/1200F
- highest fiber density per footprint without compromising performance, reliability and ease of maintenance
- standardized rack dimensions (ETS)
- rear-mounting of components for optimal access to fibers and cables
- generous frontal patchcord management
- patchcord routing without external ducts to racks mounted side-by-side and back-to-back
- ODR 1200F with two patchcord managements for overlength storage from external incoming patchcords (mainly for breakout termination units)

CONFIGURATION EXAMPLES ODR 300F

system-to-line
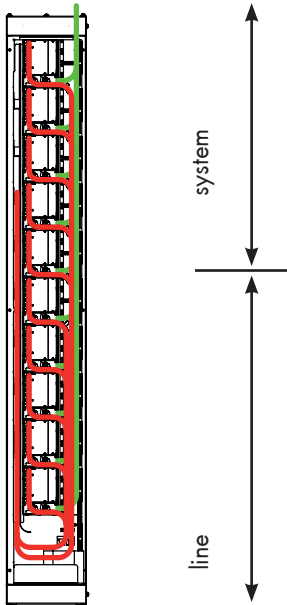
- top cable entry and patching fibers from system to line side
- alternatively bottom cable entry
- recommended patchcord length[1] for internal patching: 4.5 m

each-to-each

- top cable entry and patching fibers each-to-each
- alternatively bottom cable entry
- recommended patchcord length[1] for internal patching: 4.5 m

———— internal patchcord connection (cross-connection)
———— incoming and outgoing cables

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 2.0 up to 2.4 mm

BASE RACK ODR 300F

Features

- C shaped base rack with rear-mounted rails (ETS) for excellent front access
- lateral and backside mounting of further racks including mounting material
- hammer head stampings to mount cables at each head and base of frame, right- and left-aligned
- cable mounting plates and vertically adjustable cable brackets for fixing cables to subracks
- fast and easy installation or removal of side walls and doors with spring bolts
- telescopic mounting angle with cable bracket for over-head fixing to a maximum height of 2.76 m
- further details please see next page

Characteristics

- vertical rear fixing hole pitch standard 19"
- mounting material for subunits
- leveling with height adjustable feet
- robust steel metal construction
- earthing of all parts to the base rack
- powder coated light grey (RAL 7035)
- dimensions (W×D×H) 300 × 300 × 2200 mm

Ordering code ODR 300F

	1	2	3	4	5	6	Part in the drawing
ODR300F-							base rack 300F
	F0						without front door
	F1						front door with two locks
	F2						front door with locking handle and integrated lock
		B0/					without back wall
		B1/					with back wall
			0				without left side wall
			1				with left side wall
				0-			without right side wall
				1-			with right side wall
					C0-		without patchcord routing channel
					C1-		with patchcord routing channel
						X-	without power socket
						A	without top cover
						D	with top cover
						1	standard variant

BASE RACK ODR 300F

Top cover 300

Features
- covers the top of the base rack 300F
- brushes cover the cut-out for cable entry
- retro-fittable
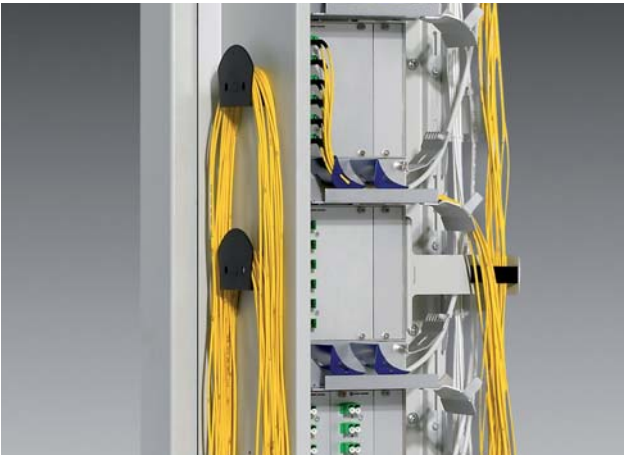
Patchcord management 300

Features
- positioning of 7 mandrels at different heights
- bend radius limitation for patchcords 35 mm
- telescopic patchcord management allows excellent access to pre-installed patchcords
- standard patchcord length
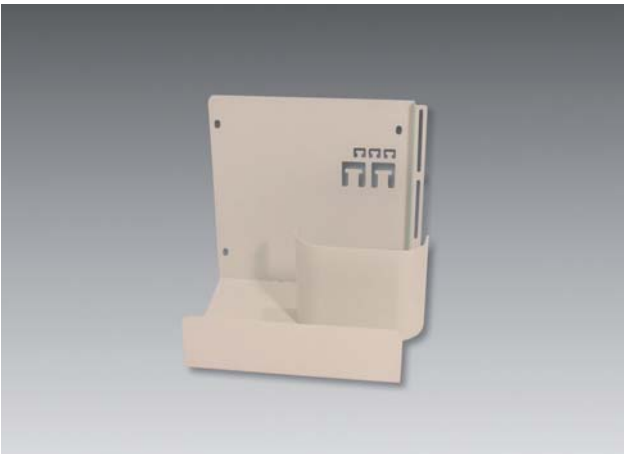
Patchcord routing channel 300

Features
- can transfer patchcords laterally to adjoining racks
- good access to patchcords from the front
- height 6 U
- includes hammer head stampings for cable fixing
- holes for mounting cable bracket for bottom cable entry
- cut-out for bottom cable entry
- mounting at the bottom of the rack

ODR 300F COMPONENTS

Subrack 300F	Unit	Item no.
ODR-SUBR-4U-2M/1S-A1	1	84015596

Features

- accommodates up to 2 MCM or 1 SCM compact modules
- bend radius limitation for incoming cables 45 mm and for patchcords 35 mm
- good access to inner space by removing the patchcord guiding channel
- includes mounting parts and conduit clamps
- height 4 U

For compact modules please see page 34

Conduit	Unit	Item no.
fixed batch quantity = 100 m	1m	84003340

Features

- for bend radius limitation of loose tubes up to Ø 3mm
- flexible and kink resistant
- easy insertion of loose tube
- 1.8 m are required for two compact modules in a subrack 300F
- material polypropylene, halogen free, white

Stripping tool 9801.20.C please see chapter «Single parts and tools»
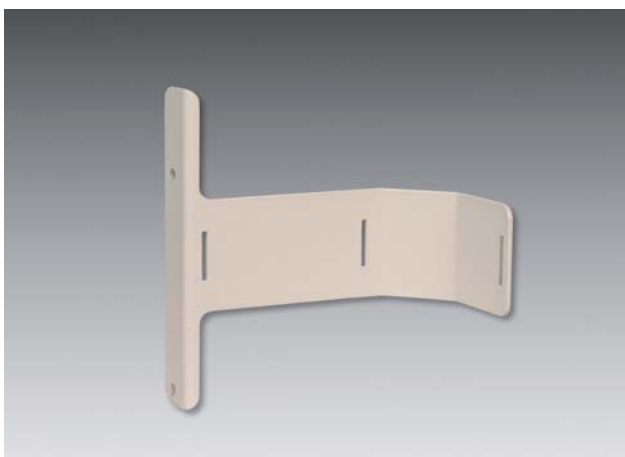
Cable separation 600F	Unti	Item no.
ODRF-ACC-600-SEP-A1	1	84003719

Features

- for separation of loose tubes and patch cables
- per subrack ODR 300F or 600F 1 cable separation 600F is recommended
- fixation of patch cables with Velcro strap, cable ties or similar components
- suitable for ODR 300F and ODR 600F

Optional cable fastening with conduit and central member fixing please see page 33

CONFIGURATION EXAMPLES FOR ODR 600F

system-to-line
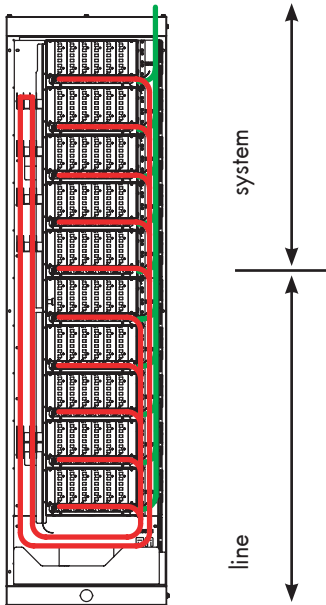
- top cable entry and patching fibers from system to line side
- alternatively bottom cable entry
- recommended patchcord length[1] for internal patching: 5.0 m

each-to-each
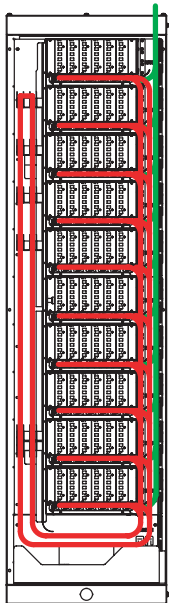
- top cable entry and patching fibers each-to-each
- alternatively bottom cable entry
- recommended patchcord length[1] for internal patching: 5.0 m

——— internal patchcord connection (cross-connection)
——— incoming/outgoing cables

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 2.0 up to 2.4 mm

CONFIGURATION EXAMPLES FOR ODR 600F

side-by-side
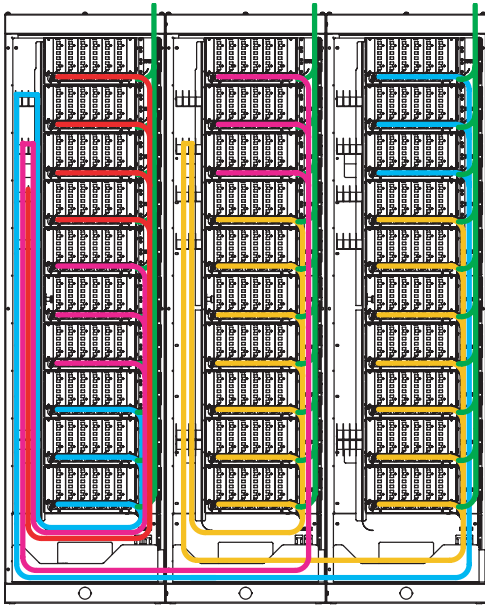
- top cable entry and patching within the same rack and to other racks
- alternatively bottom cable entry
- several ODR 600F
- recommended patchcord length[1] for:
- a) patching within the same rack: 6.0 m
  b) patching to the first rack: 6.5 m
  c) patching to the second rack: 7.0 m

back-to-back
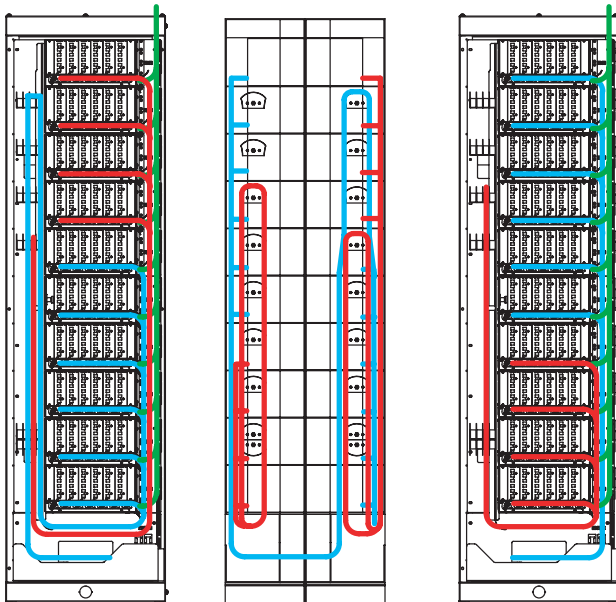
- arrangement of two ODR 600F back-to-back
- top cable entry and patching of spliced fibers from one to the backside rack
- alternatively bottom cable entry
- recommended patchcord length[1]:
  a) for internal patching: 5.0 m
  b) for patching to backside rack: 6.5 m

———— internal patchcord connection (cross-connection)
———— incoming/outgoing cables
———— patchcord connection to adjoining racks

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 2.0 up to 2.4 mm

BASE RACK ODR 600F
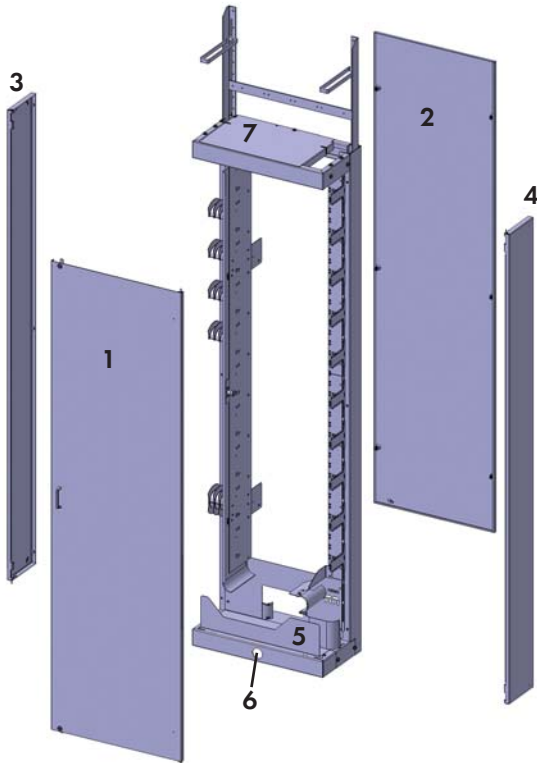
Features

- C shaped base rack with rear-mounted rails (ETS) for excellent front access
- lateral and backside mounting of further racks including mounting material
- hammer head stampings to mount cables at each head and base of frame, right- and left-aligned
- cable mounting plates and vertically adjustable cable brackets for fixing cables to subracks
- fast and easy installation or removal of side walls and doors with spring bolts
- telescopic mounting angle with cable bracket for overhead fixing to a maximum height of 2.76 m
- installation of a power socket in the base rack
- further details please see next page

Characteristics

- vertical rear fixing hole pitch standard 19"
- mounting material for subunits
- leveling with height adjustable feet
- robust steel metal construction
- earthing of all parts to the base rack
- powder coated light grey (RAL 7035)
- dimensions (W×D×H) 600 × 300 × 2200 mm

Ordering code ODR 600F

	1	2	3	4	5	6	7	Parts in the drawing
ODR600F-								base rack 600F
	F0							without front door
	F1							front door with two locks
	F2							front door with locking handle and integrated lock
		B0/						without back wall
		B1/						with back wall
			0					without left side wall
			1					with left side wall
				0-				without right side wall
				1-				with right side wall
					C0-			without patchcord routing channel
					C1-			with patchcord routing channel
						X-		without power socket
						D-		with power socket for Germany
						C-		with power socket for Switzerland
							A	without top cover
							D	with top cover
							1	standard variant

BASE RACK ODR 600F

Top cover 600

Features
- covers the top of the base rack 600F
- brush covers the cut-out for cable entry
- retro-fittable

Patchcord management 600

Features
- positioning of 7 sets of mandrels at different heights
- bend radius limitation for patchcords 35 mm
- 4 mandrels in a row for separation of different groups of patch cables
- telescopic patchcord management allows excellent access to pre-installed patchcords
- standard patchcord length
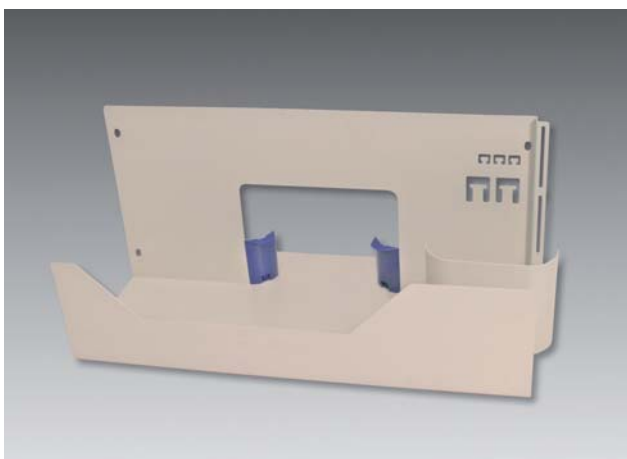
Patchcord routing channel 600

Features
- can transfer patchcords laterally or to the backside of adjoining racks
- good access to patchcords from the front
- bend radius limitation at the edges 35 mm
- height 6 U
- includes hammer head stampings for cable fixing
- holes for mounting cable bracket for bottom cable entry
- cut-out for bottom cable entry
- mounting at the bottom of the rack

ODR 600F COMPONENTS

Subrack 600F	Unit	Item no.
ODRF-SUBR-4U-6M/3S-A1	1	23040046

Features
- accommodates up to 6 MCM, 3 SCM compact modules or a combination of both
- bend radius limitation for incoming cables 45 mm and for patchcords 35 mm
- good access to inner space by pulling out or removing the integrated drawer
- includes mounting parts
- height 4 U

Compact modules please see page 34

Loose tube guiding kit 600F	Unit	Item no.
ODRF-SUBR-SUPPL-6M/3S-A1	1	84003530

Features
- to position and to limit bend radius of loose tubes within the subrack 600F
- easy mounting within the subrack
- clamping of loose tubes in the brackets
- for loose tubes of max. Ø 3.0 mm

Cable separation 600F	Unit	Item no.
ODRF-ACC-600-SEP-A1	1	84003719

Features
- for separation of loose tubes and patch cables
- per subrack ODR 300F or 600F 1 cable separation 600F is recommended
- fixation of patch cables with Velcro strap, cable ties or similar components
- suitable for ODR 300F and ODR 600F

Optional cable fastening with conduit and central member fixing please see page 33

HUBER+SUHNER FIBER OPTICS

CONFIGURATION EXAMPLES FOR ODR 900F

system-to-line

- top cable entry and patching fibers from system to line side
- alternatively bottom cable entry
- recommended patchcord length[1] for internal patching: 4.5 m

each-to-each

- top cable entry and patching fibers each-to-each
- alternatively bottom cable entry
- recommended patchcord length[1] for internal patching: 5.0 m

internal patchcord connection (cross-connection)

incoming/outgoing cables

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 2.0 up to 2.4 mm

CONFIGURATION EXAMPLES FOR ODR 900F

side-by-side
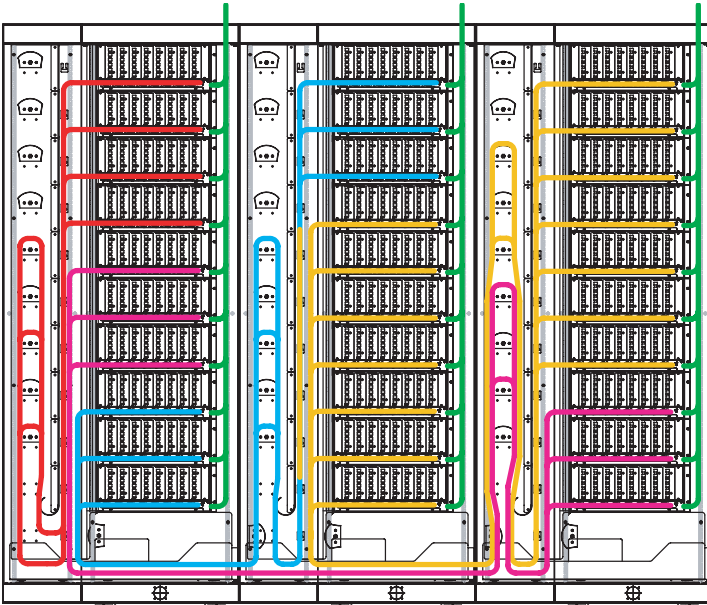
- top cable entry
- patching within the same rack and to other racks
- alternatively bottom cable entry
- several ODR 900F
- recommended patchcord length[1] for:
  a) patching within the same rack: 4.5 m
  b) patching to the first rack: 5.5 m
  c) patching to the second rack: 6.5 m

back-to-back
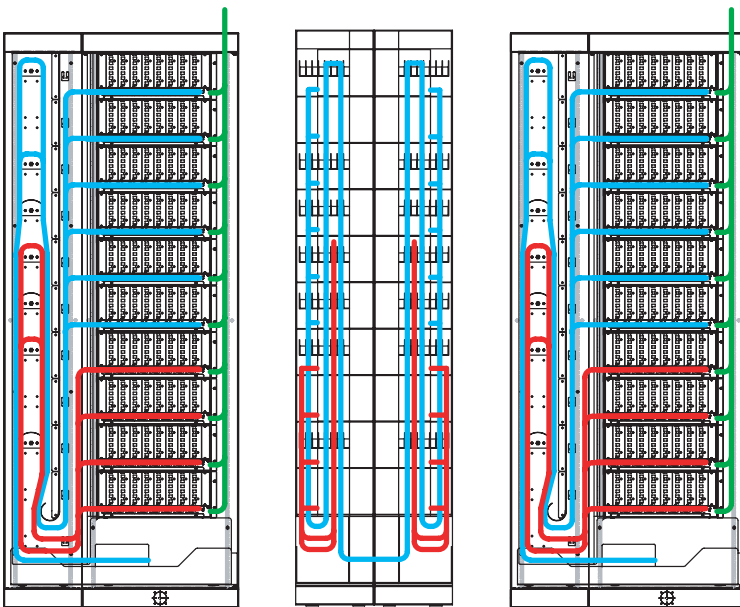
- arrangement of two ODR 900F back-to-back
- top cable entry and patching of spliced fibers from one to the backside rack
- alternatively bottom cable entry
- recommended patchcord length [1] for:
  a) internal patching: 5.0 m
  b) patching to backside rack: 8.0 m

internal patchcord connection (cross-connection)
incoming/outgoing cables
patchcord connection to adjoining racks

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 2.0 up to 2.4 mm

BASE RACK ODR 900F
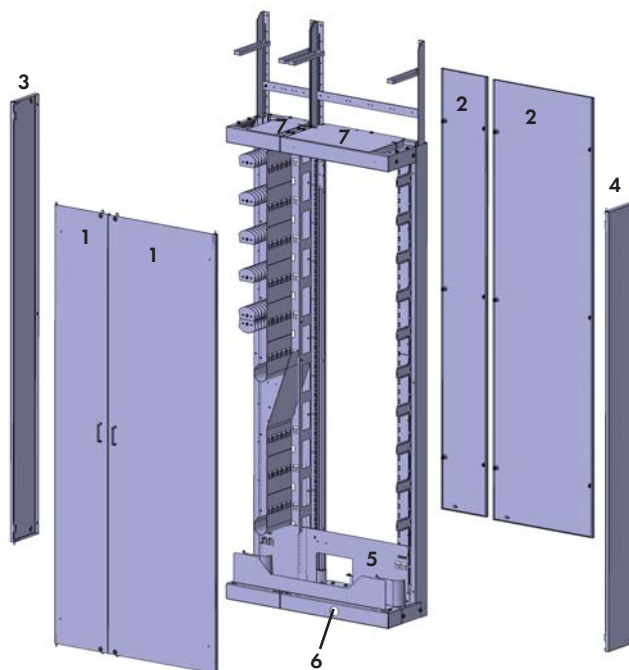
Features

- ODR 900F consists of base rack 600 and 300
- C shaped base racks with rear-mounted rails (ETS) for excellent front access
- lateral and backside mounting of further racks including mounting material
- hammer head stampings to mount cables at each head and base of frame, right- and left-aligned
- cable mounting plates and vertically adjustable cable brackets for fixing cables to subracks
- fast and easy installation or removal of side walls and doors with spring bolts
- telescopic mounting angles with cable bracket for overhead fixing for a maximum height of 2.76 m
- further details please see next page

Characteristics

- vertical rear fixing hole pitch standard 19"
- mounting material for subunits
- leveling with height adjustable feet
- robust steel metal construction
- earthing of all parts to the base rack
- powder coated light grey (RAL 7035)
- dimensions (W×D×H) 900 × 300 × 2200 mm

Ordering code ODR 900F

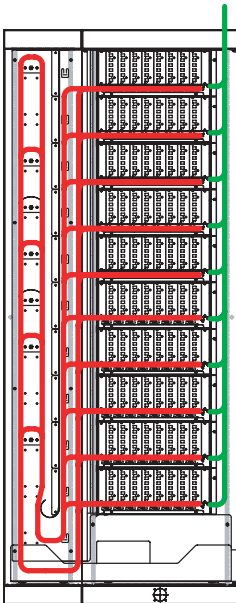|	1	2	3	4	5	6	7	Part in the drawing
ODR900F-								base rack 900F
	F0							without front doors
	F1							front doors with two locks
	F2							front doors with locking handle and integrated lock
		B0/						without back wall
		B1/						with back wall
			0					without left side wall
			1					with left side wall
				0-				without right side wall
				1-				with right side wall
					C0-			without patchcord routing channel
					C1-			with patchcord routing channel
						X-		without power socket
						D-		with power socket for Germany
						C-		with power socket for Switzerland
							A	without top covers
							D	with top covers
							1	standard variant

CONFIGURATION EXAMPLE FOR ODR 1200F

system-to-line
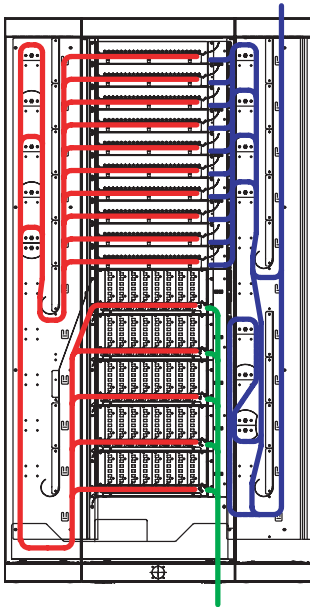
- top cable entry and patching fibers from system to line side
- alternatively bottom cable entry
- recommended patchcord length[1] for
  a) internal patching: 4.5 m
  b) external patching: 5.0 m until rack top exit

——————— internal patchcord connection (cross-connection)
——————— external patchcord/cable connection (interconnection)
——————— incoming/outgoing cables

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 2.0 up to 2.4 mm

BASE RACK ODR 1200F
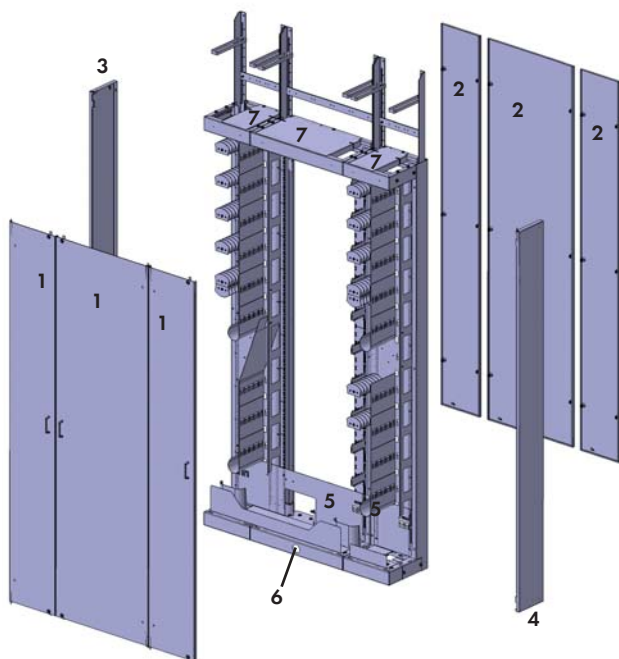
Features

- ODR 900F consists of a base rack 600 and two base racks 300
- C shaped base racks with rear-mounted rails (ETS) for excellent front access
- lateral and backside mounting of further racks including mounting material
- hammer head stampings to mount cables at each head and base of frame, right- and left-aligned
- cable mounting plates and vertically adjustable cable brackets for fixing cables to subracks
- fast and easy installation or removal of side walls and doors with spring bolts
- telescopic mounting angles with cable bracket for over-head fixing for a maximum height of 2.76 m
- overlength storage area for patchcords
- further details please see next pages

Characterisics

- vertical rear fixing hole pitch standard 19"
- mounting material for subunits
- rack leveling with height adjustable feet
- robust steel metal construction
- earthing of all parts to the base rack
- powder coated light grey (RAL 7035)
- dimensions (W×D×H) 1200 × 300 × 2200 mm

Ordering code ODR 1200F

	1	2	3	4	5	6	7	Part in drawing
ODR1200F-								base rack 1200F
	F0							without front doors
	F1							front doors with two locks
	F2							front doors with locking handle and integrated lock
		B0/						without back walls
		B1/						with back walls
			0					without left side wall
			1					with left side wall
				0-				without right side wall
				1-				with right side wall
					C0-			without patchcord routing channels
					C1-			with patchcord routing channels
						X-		without power socket
						D-		with power socket for Germany
						C-		with power socket for Switzerland
							A	without top covers
							D	with top covers
							1	standard variant

BASE RACKS ODR 900F AND 1200F

Top covers 300/600

Features
- covers the top of the base racks 300F and 600F
- brushes cover the cut-out for cable entry
- retro-fittable

Patchcord management 900

Features
- positioning of 7 sets of mandrels at different heights
- bend radius limitation for patchcords 35 mm
- 8 mandrels in a stack for separation of different groups of patch cables
- fast and easy access to patchcords from the front
- configurable positions of separation and guiding plates
- default guiding of all patchcords by means of separation plates
- additional patchcord management for ODR 1200F for storing patchcords from the system side
- standard patchcord length
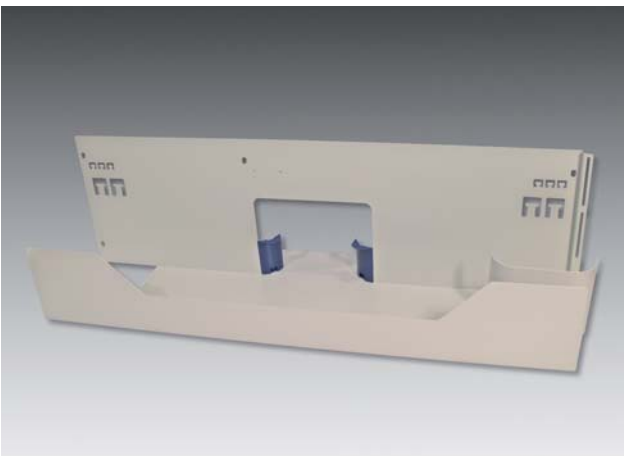
Patchcord routing channel 900

Features
- can transfer patchcords laterally or to the backside of ad-joining racks
- good access to patchcords from the front
- bend radius limitation at the edges 35 mm
- height 6 U
- includes hammer head stampings for cable fixing
- holes for mounting cable bracket for bottom cable entry
- cut-out for bottom cable entry
- additional patchcord routing channel 300 for ODR 1200F
- mounting at the bottom of the rack

HUBER+SUHNER FIBER OPTICS

ODR 900F AND 1200F COMPONENTS

Subrack 900F	Unit	Item no.
ODRF-SUBR-4U-8M/4S-A1	1	23040051

Features
- accommodates up to 8 MCM, 4 SCM compact modules or a combination of both
- bend radius limitation for incoming cables 45 mm and for patchcords 35 mm
- good access to inner space by pulling out or removing the integrated drawer
- includes mounting parts
- height 4 U

Compact modules please see page 34

Loose tube guiding kit 900F	Unit	Item no.
ODRF-SUBR-SUPPL-8M/4S-A1	1	84003334

Features
- to position and to limit bend radius of loose tubes within the subrack 900F
- easy mounting within the subrack
- clamping of loose tubes in the brackets
- for loose tubes of max. Ø 3.0 mm

Optional cable fastening with conduit and central member fixing please see page 33

BREAKOUT TERMINATION UNIT 900F

Suitable subunit for accommodating patchcords, manifold cables or breakout cable like SMARTLINE or MASTERLINE

- up to 48 adapters, resp. fibers
- ready to install; pre-assembled with adapters
- height 2 U
- captive frontal cover plate for front side patchcord cables
- bend radius limitation of 35 mm
- good access to inner space by pulling out the drawer with adapter plate and patchcord management
- hinged and locking separation plate within the unit for easy installation of the patchcords
- recommended patchcord length 1 m
- mounting parts included
- suitable for ODR 900F, 1200F and 800F (19″)

Ordering code							Description
BTU –							Breakout Termination Unit
	900 –						for ODR 900F, 1200F and 800F (19″)
		2U –					height (2 height units)
			XX/				code for adapter type[1], please see inside back cover
				SM –			singlemode
				MM –			multimode
					nn –		number of adapters; max. 48
						A1	standard variant

1) Available adapter types: E-2000™, SC simplex, LX.5 duplex and LC duplex. Other types on request.

HUBER+SUHNER FIBER OPTICS

CABLE FASTENING

Mounting angle	Unit	Item no.
ODR-ACC-FIX-BRACKET-A1	1	84019194

Features
- for fixing a cable and conduit fixing plate or for fixing a cable duct
- can be fixed on top of base rack 300F und 600F
- for ODR 300F, 600F, 900F and 1200F
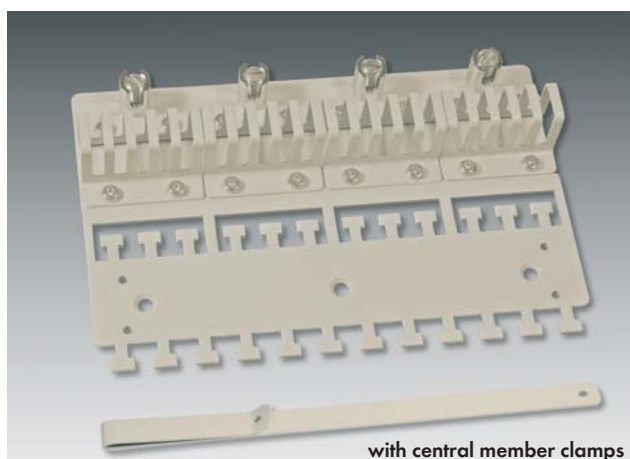
with central member clamps

without central member clamps

Cable and conduit fixing plate	Unit	Item no.
with central member clamps ODR-B/OUT-PLT-300-CSM-4-A1	1	84018559
without central member clamps ODR-B/OUT-PLT-300-CSM-A1	1	84015905

Features
- secure strain relief of cable jacket, central member and conduits
- 4 positions for thick cables with each max. 12 loose tubes or 8 positions for thin cables with each max. 6 loose tubes
- suitable for different cable diameters
- robust
- simple installation
- can be mounted in conjunction with mounting angle on base racks
- supplied with conduit-locking plate
- kit can be supplied with or without central strength member clamps
- fixing screws included
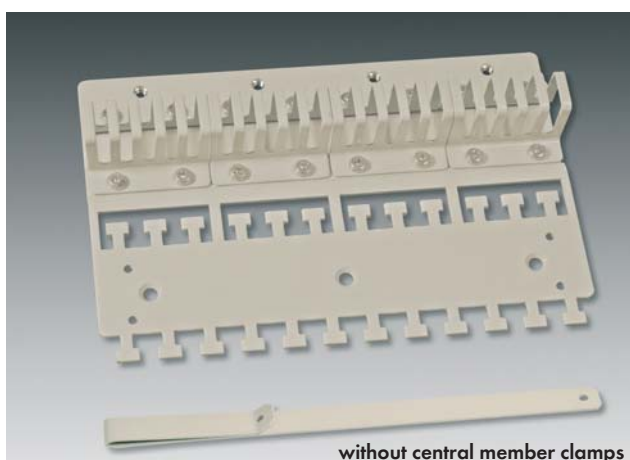
COMPACT MODULES

HUBER+SUHNER compact modules for MultiCircuit (MCM) or SingleCircuit (SCM) applications combine simple installation and maximum security for your optical network. An integrated loose tube storage facility in each module allows the removal to the splicing machine without disturbing neighbouring modules.

Handling advantages
- installation of fibers and loose tubes without disassembly of compact module
- easy assembly of fibers in compact module
- installation of modules by one installer from front side
- top-mounted guiding rail for simple insertion and removal of modules

Fiber management features
- open fiber guidance throughout the whole module (without insertion through holes)
- separate storage room for loose tubes and pigtails
- integrated loose tube management with generous loose tube reserve up to 1.5 m
- bend radius limitation of 35 mm for fibers, 45 mm for loose tubes
- bend radius limitation secures the long-term performance of optical fibers without loss caused by micro-bending
- for heat shrink and sandwich splice protectors

Properties
- for all connector types including SFF
- vertically arranged adapters for accommodation of 12 fibers
- front plate width: 9 subunits for MCM and 18 subunits for SCM, height: 3 units
- insertion in subrack 300F, 600F or 900F
- channel numbering on front plate
- optional labeling sticker for front plate

Splice cassette and module features please see chapter «Splice Cassettes and Accessories»

Instead of compact modules, either blind or adapter front plates can be mounted into subracks 300F, 600F and 900F.

Please note
Compact modules cannot be inserted into Fiberport subracks and vice versa.

MCM COMPACT MODULES

**example module
for splicing only**

Ordering code									Description
MCM3-9U-									MCM compact module with 9 subunits
	LX5-								assembled with LX.5 pigtails
	FLC-								assembled with LC pigtails
	FLSH-								assembled with E-2000™ pigtails (compact adapters)
	FSC-								assembled with SC pigtails
	FSCD-								assembled with flangeless SC duplex adapters/SC pigtails
	FST-								assembled with ST pigtails
	FCPC-								assembled with FCPC pigtails
	SPL-								for splicing only
		12-							number of pigtails
			A						singlemode APC 8° 9 µm
			B						singlemode PC 9 µm
			C						multimode 50 µm
			D						multimode 62.5 µm
				S					single-coloured pigtails (standard)
				C					colour-coded pigtails
					B-				High-End assembly class for singlemode only
					M-				multimode
						SW0-			splice holder for sandwich splice protectors (excl. splice protectors)
						HS0-			splice holders for heat shrink splice protectors (excl. splice protectors)
							000		single-coloured pigtails/fibers - standard
							001		fiber colour code acc. to Swisscom, please see inside back cover
							002		fiber colour code acc. to DIN VDE 0888, please see inside back cover
							003		fiber colour code acc. to ISO, please see inside back cover

single-coloured pigtails/fibers
SM 9µm   yellow
MM 50µm   orange
MM 62µm   blue

capacity per subrack
300F: max. 2 modules
600F: max. 6 modules
900F: max. 8 modules

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

SCM COMPACT MODULES
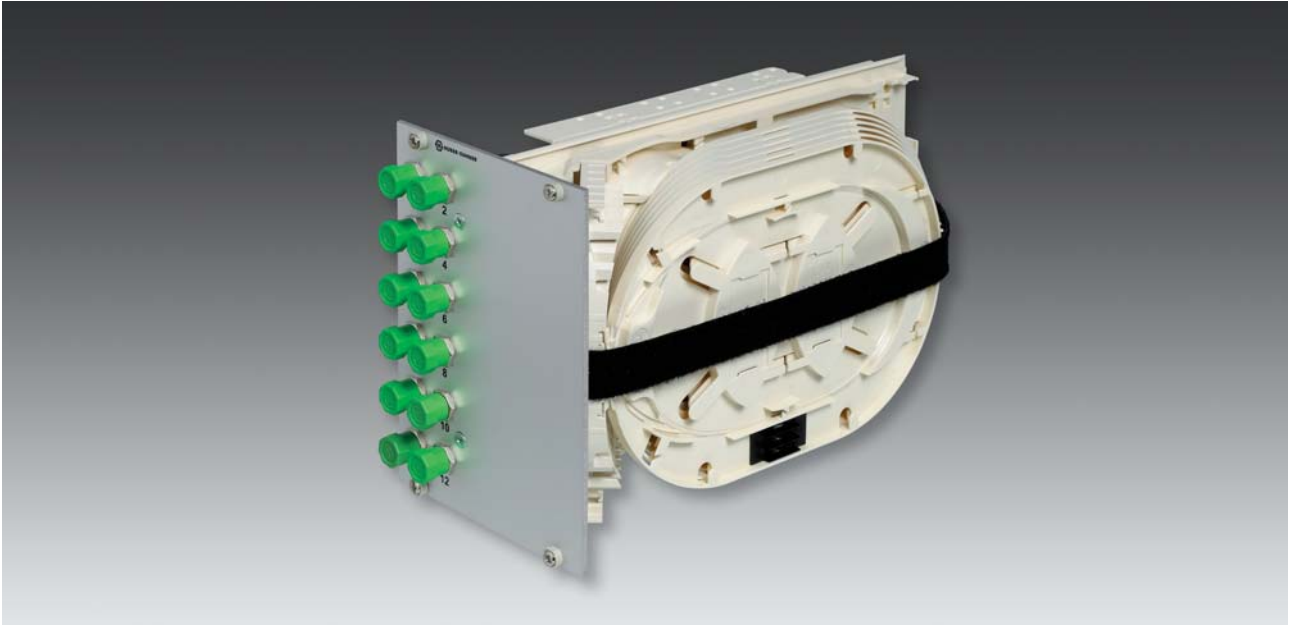
Ordering code							Description
SCM3-18U-							SCM compact module with 18 subunits
	LX5-						assembled with LX.5 pigtails
	FLC-						assembled with LC pigtails
	FLSH-						assembled with E-2000™ pigtails (compact adapters)
	FSC-						assembled with SC pigtails
	FCPC-						assembled with FCPC pigtails
	SPL-						for splicing only
		12-					number of pigtails
			A				singlemode APC 8° 9 µm
			B				singlemode PC 9 µm
			C				multimode 50 µm
			D				multimode 62.5 µm
				S			single-coloured pigtails (standard)
				C			colour coded pigtails
					B-		High-End assembly class for singlemode only
					M-		multimode
						SW0-	splice holder for sandwich splice protectors (excl. splice protectors)
						HS0-	splice holders for heat shrink splice protectors (excl. splice protectors)
						000	single-coloured pigtails/fibers - standard
						001	fiber colour code acc. to Swisscom, please see inside back cover
						002	fiber colour code acc. to DIN VDE 0888, please see inside back cover
						003	fiber colour code acc. to ISO, please see inside back cover

single-coloured pigtails/fibers
SM 9µm   yellow
MM 50µm   orange
MM 62µm   blue

capacity per subrack
300F: max. 1 module
600F: max. 3 modules
900F: max. 4 modules

HUBER+SUHNER FIBER OPTICS

MCM SPLITTER MODULES

- modules with integrated, high-quality splitters and pre-terminated fiber ends
- front facing orientation of adaptors for fast access to connectors and patchcords
- fast installation on site
- access identification by sealing
- splitter configuration up to 1:16 per module

Ordering code									Description
MCM3-									MCM module
	9U-								9 subunits
		73/							input with connector: code for adapter type, please see inside back cover
			89-						output with connectors: code for adapter type, please see inside back cover
				01x					number of splitters per splitter module
					1x16-				splitter configuration 1x2, 1x8, 1x16
						EE			equal split
						90			unequal split 70:30, 80:20, 90:10
							01-		singlemode fiber 9/125 µm
								01	dual window 1310 nm and 1550 nm
MCM3-	**9U-**	**73/**	**89-**	**01x**	**1x16-**	**EE**	**01-**	**01**	**ordering example**

COMPACT MODULES ACCESSORIES

Blind front plate	Unit	Item no.
FPL-MCM-BLK9-00-A1	1	84003000

Features
- for covering of unused positions in subrack 300F / 600F / 900F
- 9 SU width as MCM compact module
- mounting material included
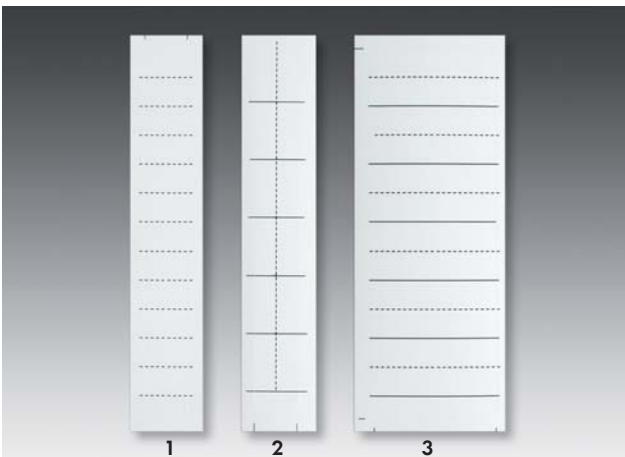
	Labels	Unit	Item no.
1	for MCM compact modules with SC/E-2000™ adapters LABEL-MCM-SC/E2-A1	10	84005489
2	for MCM compact modules with ST, FCPC, LX.5, LC adapters LABEL-MCM-DIV-A1	10	84005487
3	for SCM compact modules LABEL-SCM-DIV-A1	10	84005491

Features
- for identification of each fiber channel, fast adhesion

HUBER+SUHNER FIBER OPTICS

ODR – SIDEACCESS

General features for both racks
- low entry costs / grows with network
- standardized rack dimensions (ETS)
- rear-mounting of components for better access to fibers and cables
- modular subunits offer complete customer configuration
- high fiber density without compromising performance, reliability and handling
- bending radius control throughout; radius 30 mm for fibers and patchcords

- intelligent variants for storing, routing and cross-connecting fiberoptic patchcords
- management for loose tube or pre-terminated cables
- compatible with all horiziontal LISA fiber trays
- interface to „Lightpath" ducting system
- easy and fast to install and maintain

Characteristics	ODR 600S	ODR 900S
dimensions (W×D×H)	600 × 300 × 2200 mm	900 × 300 × 2200 mm
number of U without cross-connect unit	40	40
number of U with cross-connect unit	32	–
number of fiber trays without cross-connect unit	80	80
number of fiber trays with cross-connect unit	64	–
capacity of fiber without cross-connect unit	960	960 (1920 SFF)
capacity of fiber with cross-connect unit	768	–

Features ODR 600S
- highest fiber density and comfortable patchcord guiding for «system-to-line» connections
- patchcord management with subunit below the fiber trays

Features ODR 900S
- high fiber density within a limited footprint
- generous front-accessible patchcord management at the right side of the fiber trays

Applications
- telecoms
- CATV
- WAN/MAN (carrier network)

CONFIGURATION EXAMPLES ODR 600S

system-to-line
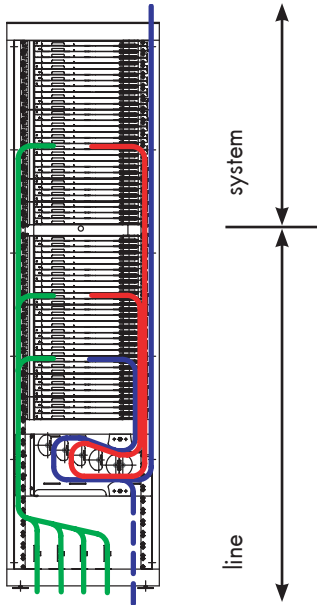
- bottom cable entry and approx. 20% internal patching and approx. 80% patchcord exit for connection to system rack
- max. 64 fiber trays (32 U), 768 fibers
- recommended patchcord lengths[1] for:
  a) internal patching: 4.0 m
  b) external patching: 4.5 m until rack top exit, 3.0 m until rack bottom exit

system-to-line
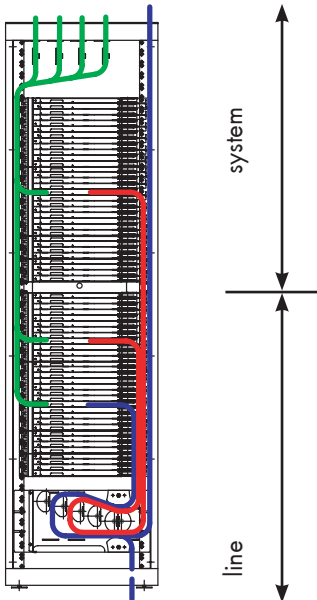
- top cable entry and approx. 20% internal patching and approx. 80% patchcord exit for connection to system rack
- max. 64 fiber trays (32 U), 768 fibers
- recommended patchcord lengths[1] for:
  a) internal patching: 4.0 m
  b) external patching: 5.0 m until rack top exit, 2.5 m until rack bottom exit

——— internal patchcord connection (cross-connection)
——— external patchcord/cable connection (interconnection)
——— incoming/outgoing cables (line)

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 1.7 mm

HUBER+SUHNER FIBER OPTICS

CONFIGURATION EXAMPLES ODR 600S

system-to-line M3K

- bottom cable entry, 100% internal patching and upper M3K for connection with system rack
- alternatively top cable entry/bottom cable exit
- max. 64 fiber trays, 768 fibers
- recommended patchcord length[1] for internal patching: 3.0 m

side-by-side
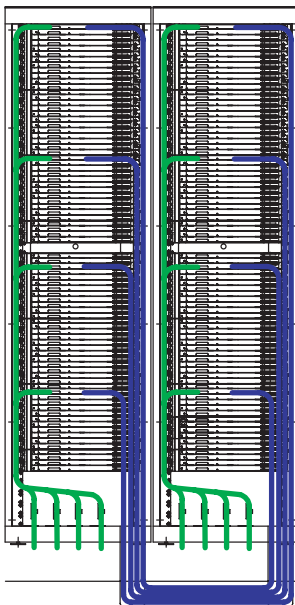
- bottom cable entry and bottom patchcord exit for patching line to system rack
- alternatively top cable entry/top patchcord exit
- max. 80 fiber trays, 960 fibers per rack
- recommended patchcord length[1]: for patching to adjoining rack: 6.5 m; storing of patchcord overlength in cable ducting

——	internal patchcord connection (cross-connection)
——	external patchcord/cable connection (interconnection)
——	incoming/outgoing cables (line)

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 1.7 mm

ODR 600S - READY FOR INSTALLATION
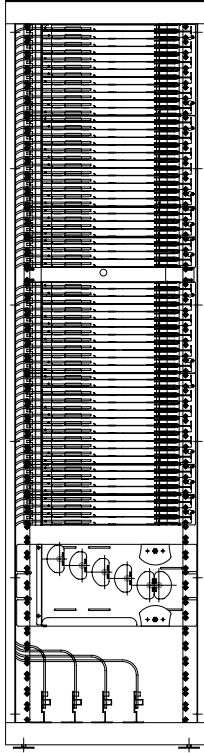
The standard equipment includes
- rack with mounted components according ordering code
- cover with brush at the cut-out for cable entry
- door with locking handle
- 1 document holder
- 1 conduit bracket
- 3 retainers for cables and conduits

| Ordering code ODR 600S										Description
ODRB-SFS-PB-										ODR 600S with panels, steel door and brush top cover
	1									one conduit fitted per fiber tray
		0								slotted conduit V0 (used for twisted loose tubes only)
		1								solid conduit V0
			T							cable entry from the top
			B							cable entry from the bottom
				80-						80 fiber tray positions (without cross-connect unit)
				64-						64 fiber tray positions (for integrated cross-connect unit)
					FTMS					front-back type of rail, 300 mm depth[1]
					LTMSC					left-right type, (19" plate)[2]
						n				number of cable fixing plates/rails. Max. 4 rails (FTMS) or 2 of 19" plates (LTMSC)
							ST			tray units fitted
							XB			tray units and cross-connect unit fitted at the bottom
							XM			tray units and cross-connect unit fitted in the middle
							XT			tray units and cross-connect unit fitted at the top
								A	1	standard variant
ODRB–SFS-PB-	**1**	**1**	**B**	**64-**	**FTMS**	**4**	**XB**	**A**	**1**	**example**

1) Cable mounting type front-back of rail, 300mm depth, with positions for cable jacket, clamps for conduits and central strength members
2) Cable mounting type left-right (19" plate) with positions for cable jacket, clamps for conduits, clamps for central strength members and cover

HUBER+SUHNER FIBER OPTICS

RACK COMPONENTS ODR 600S

1

2

3

Features

- base rack with rear-mounted rails for fast and easy installation from front
- easy and fast installation and removing of door
- leveling by height adjustable feet
- door with locking handle and 2 keys
- robust steel metal construction
- light grey powder coated (RAL 7035)
- dimensions (W×D×H): 600 × 300 × 2200 mm

	Description	Unit	Item no.
1	base rack 600 ODR-FRAME-600X300X2200	1	84004730
2	solid door (steel plate) 600 ODR-FD-SFS-600X2200	1	84004722
3	top cover 600 (brush type) ODR-TC-B-600X300	1	84004742

Description	Unit	Item no.
assembled rack with steel door and brush cover ODRB-SFS-B-A1	1	84005269

CONFIGURATION EXAMPLES ODR 900S

system-to-line in sections
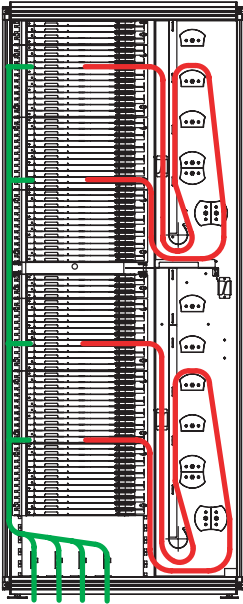
- bottom cable entry and internal patching within either the top section or bottom section of fiber trays
- alternatively top cable entry
- max. 80 fiber trays, 960 fibers (1920 SFF)
- recommended patchcord length[1] for internal patching: 3.5 m

system-to-line

- bottom cable entry, 100% internal patching and upper M3K for connection with system rack
- alternatively top cable entry
- max. 80 fiber trays, 960 fibers (1920 SFF)
- recommended patchcord length[1] for internal patching: 5.0 m

internal patchcord connection (cross-connection)
external patchcord/cable connection (interconnection)
incoming/outgoing cables (line)

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 1.7 mm

CONFIGURATION EXAMPLE ODR 900S

side-by-side
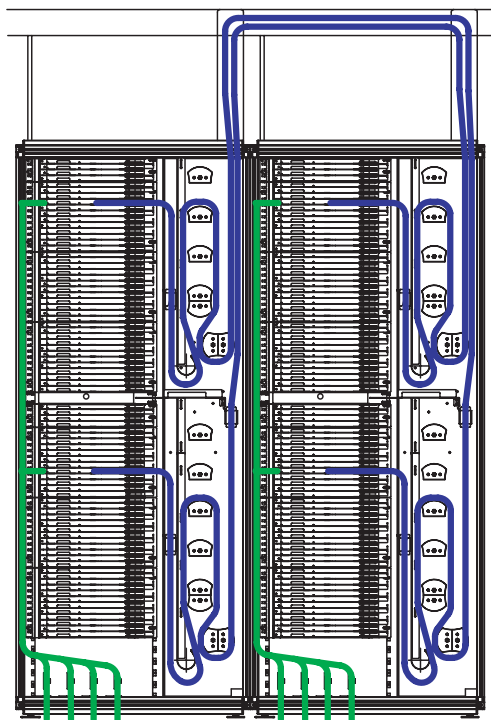
- bottom cable entry and top patchcord exit for patching line to system rack
- alternatively top cable entry/bottom patchcord exit
- max. 80 fiber trays, 960 fibers (1920 SFF) per rack
- recommended patchcord length[1] for patching to adjoining rack: 9.5 m

———————— internal patchcord connection (cross-connection)
———————— external patchcord/cable connection (interconnection)
———————— incoming/outgoing cables (line)

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. Please see chapter «Introduction» pages «Services» for more information.

1) Ordering code for patchcords please see chapter «Connectivity», recommended patchcord Ø: 1.7 mm

ODR 900S - READY FOR INSTALLATION

The standard equipment includes:
- rack with mounted components according to ordering code
- cover with brush at the cut-out for cable entry
- wardorbe door with locking handle
- 1 document holder
- 1 conduit bracket
- 3 retainers for cables and conduits

Ordering code ODR 900S										Description
ODRA-SFS-PB–										ODR 900S with panels, steel door and brush top cover
	1									one conduit fitted per fiber tray
	2									two conduits fitted per fiber tray
		0								slotted conduit V0 (used for twisted loose tubes only)
		1								solid conduit V0
			T							cable entry from the top
			B							cable entry from the bottom
				80–						80 fiber tray positions
					FTMS					front-back type of rail, 300 mm depth [1]
					LTMSC					left-right type, (19" plate) [2]
						n				number of cable fixing plates/rails. Max. 4 rails (FTMS) or 2 of 19" plates (LTMSC)
							ST			tray units fitted
								A	1	standard variant
ODRA-SFS-PB-	**2**	**1**	**B**	**80-**	**FTMS**	**4**	**ST**	**A**	**1**	**example**

1) Cable mounting type front-back of rail, 300mm depth, with positions for cable jacket, clamps for conduits and central strength members
2) Cable mounting type left-right (19" plate) with positions for cable jacket, clamps for conduits, clamps for central strength members and cover

RACK COMPONENTS ODR 900S

1

2

3

Features

- base rack with rear-mounted rails including threaded holes for fast and easy installation from front
- rear fixings standard 19"
- easy and fast installation and removing of doors
- leveling by height adjustable feet
- wardrobe door with locking handle and 2 keys
- robust steel metal construction
- light grey powder coated (RAL 7035)
- dimensions (W×D×H) 900 × 300 × 2200 mm

	Description	Unit	Item no.
1	base rack 900 with patchcord management ODR-FRAME-900X300X2200-A1	1	84004732
2	front door (steel plate) 900 ODR-FD-SWS-900X2200-A1	1	84004724
3	top cover 900 (brush type) ODR-TC-B-900X300	1	84004747

Description	Unit	Item no.
assembled rack with steel wardrobe doors, patchcord management and brush cover ODRA-SFS-B-A1	1	84005271

ODR 600S / 900S ACCESSORIES

Fixing kit	Unit	Item no.
for fixing racks to a raised computer floor ODR-FFK-RF-1	1	84004337

Fixing kit	Unit	Item no.
for fixing racks to a concrete floor ODR-FFK-SF-1	1	84004341

Baying kit	Unit	Item no.
ODR-BAYING-TOP-KIT	1	84005247

Features
- to connect racks positioned side-by-side or back-to-back
- mounting on top of the racks
- can be mounted with or without top cover
- kit with 2 plates and 4 srews
- suitable for ODR 600S and 900S

ODR TRAY UNITS
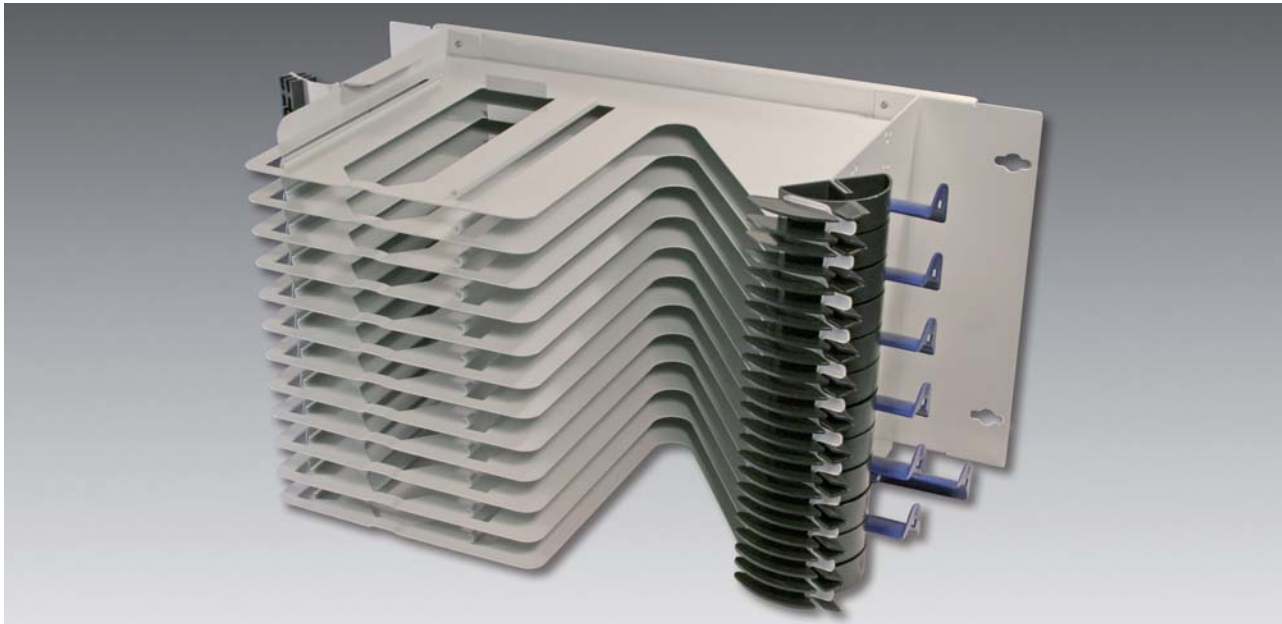
Features

- available as 1 U, 2 U, 3 U or 6 U units
- each U accommodates 2 fiber trays with each max. capacity of 12 fibers (24 with SFF)
- 19" rear mounted for improved access
- retractable clips for fixing conduits
- horizontal fiber tray mounting maximises available height footprint
- integrated patchcord mandrels and bend radius limiters

- allows fiber trays and connected patchcords to slide in and out independently
- silicon patchcord retaining rings ensure safe clamping of multiple patchcords
- powder coated steel construction
- colour light grey (RAL 7035)
- patchcord retaining ring, clips for conduit fixing, mandrels, bend radius limiters and fixing kit included

Ordering information	Height (U)	Unit	Item no.
ODR-TU-1U-HOR-A1	1	1	84016894
ODR-TU-2U-HOR-A1	2	1	84016896
ODR-TU-3U-HOR-A1	3	1	84016901
ODR-TU-6U-HOR-A1	6	1	84016903

Note: clips for conduit fixing are supplied with the unit

Ordering information accessory

Patchcord retaining ring	Unit	Item no.
ODR-PATCHCORD-BND-3-100P	100	84014506

ODR COMPONENTS FOR CABLE BREAKOUT
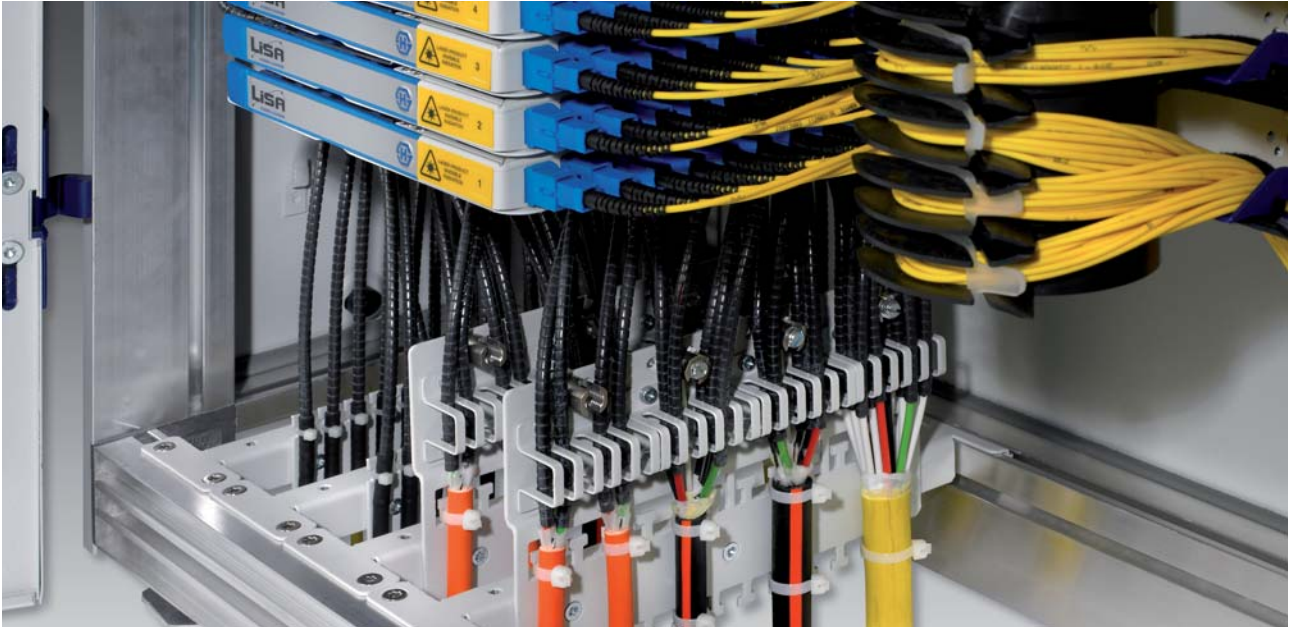
General features

- provides a secure anchor for incoming loose tube cables within an ODR
- reversible – for top and bottom cable entry
- suitable for different cable diameters
- provides protection for loose tubes
- expandable – further rails can be added
- front-back mounting and sideways movable of rails provides easy access to existing cables and rapid installation of new ones

- available for cable tie fixing or customer requirement
- easy installation and removal
- for use in ODR 600S and ODR 900S

Cable tie plates with simplex loose tubes

Recommended positions of conduit bracket (1) and retainer for cables and conduits (2)

HUBER+SUHNER FIBER OPTICS

ODR COMPONENTS FOR CABLE BREAKOUT
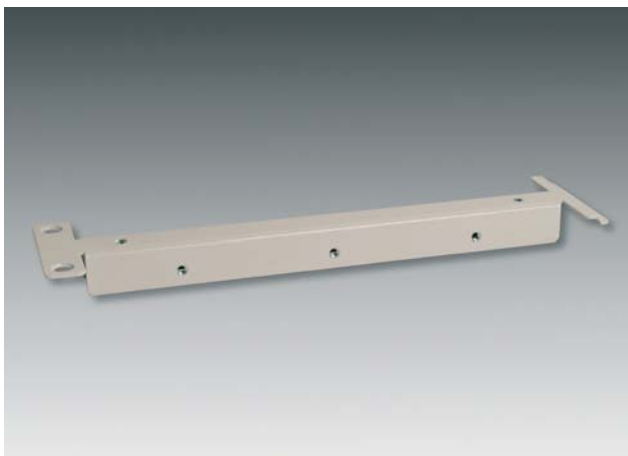
Cable tie rail	Unit	Item no.
ODR-B/OUT-RAIL-300-A1	1	84010119

Features
- for cable fixing using fixing plates or tie plates
- suitable for top or bottom fixing
- fast and easy installing and removing
- cable fixing on one or two sides
- mounting parts included
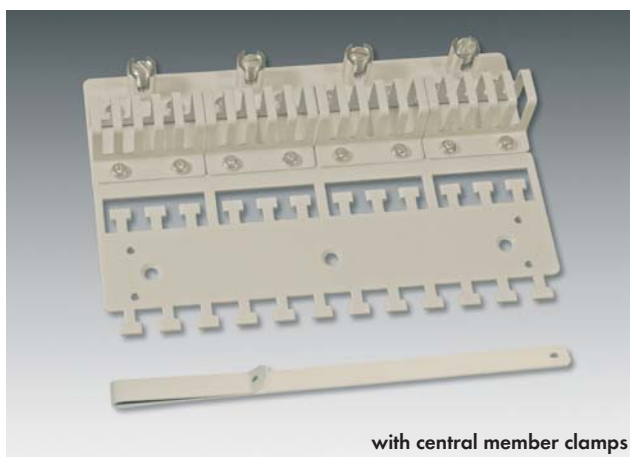
with central member clamps

Cable and conduit fixing plate	Unit	Item no.
with central member clamps ODR-B/OUT-PLT-300-CSM-4-A1	1	84018559
without central member clamps ODR-B/OUT-PLT-300-CSM-A1	1	84015905

Features
- recommended for all loose tube cables
- secure strain relief of cable jacket, central member and conduits
- 4 positions for thick cables with each max. 12 loose tubes or 8 positions for thin cables with each max. 6 loose tubes
- suitable for different cable diameters
- robust
- simple installation
- cable fixing with cable ties
- can be mounted in conjunction with cable tie rail in base racks
- supplied with conduit-locking plate
- kit can be supplied with or without central strength member clamps
- fixing screws included
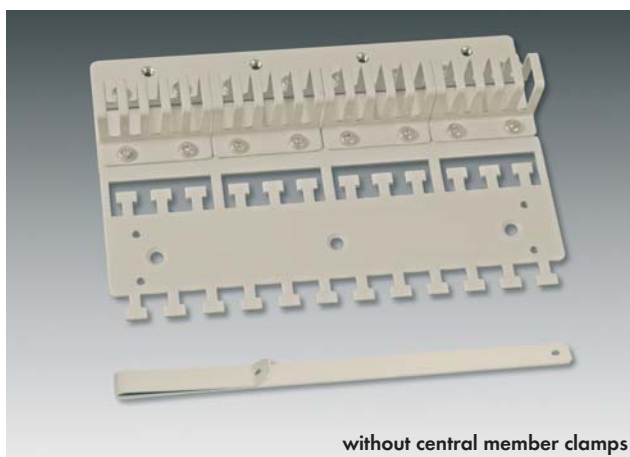
without central member clamps

ODR COMPONENTS FOR CABLE BREAKOUT
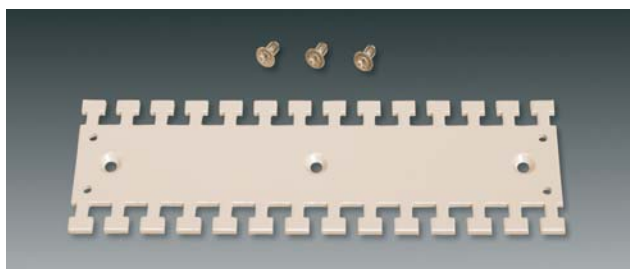
Cable tie plate	Unit	Item no.
ODR-B/OUT-PLT-300-A1	1	84004245

Features
- recommended for breakout, MASTERLINE or simplex loose tube cables
- for 14 cable fixing positions
- cable fixing with cable ties
- mounting screws included

Accessory

Cable tie - nylon 4.7 × 203 mm	Unit	Item no.
fixed batch quantity = 100	1	23236335
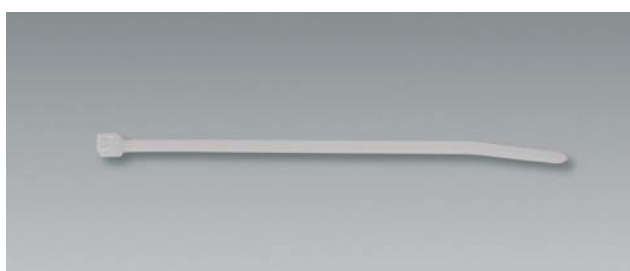
Optional

cover

Cable breakout cover	Unit	Item no.
ODR-B/OUT-COVER-300-A1	1	84010121

Features
- optional installation
- retro-fittable, above rails and cables which are already installed
- with a hinged door and a latch
- mouning parts included
- recommended for expansion up to 3 cable tie rails
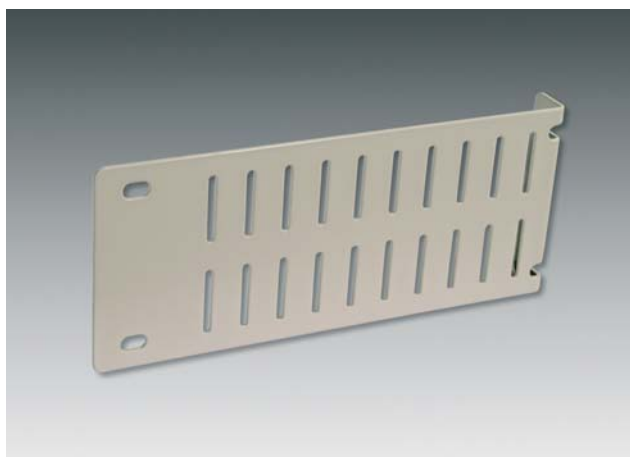
Conduit bracket	Unit	Item no.
ODR-MMU-UNI-STA-A1	1	84018739

Features
- bracket holds the conduits of the loose tubes at the side wall of the rack so that the access to the fiber trays is improved
- positioning near the cable breakout, see page 50 at the bottom
- secure fixing at the rails of the ODR with 4 fixing points
- robust plate
- grouping of conduits with Velcro strap
- mounting material included

ODR COMPONENTS FOR CABLE BREAKOUT

Retainer for cables and conduits	Unit	Item no.
ODR-CMU-UNI-STA-A1	1	84004714

Features
- guides cables and conduits vertically into a rack
- positioning at a greater distance to the cable breakout, see page 50 at the bottom
- secure fixing at the rails of the ODR with 2 fixing points
- easy mounting of cables through slot
- 3 pieces per rack are recommended
- mounting material included

Conduit	Unit	Item no.
ODR-CONDUIT-VO-SLD-5M	5 m	84014504
ODR-CONDUIT-VO-SLD-100M	100 m	84014501

Features
- for bending radius limitation of loose tubes up to Ø 3 mm
- flexible and kink resistant
- easy insertion of loose tube
- flame-retardant plastic (UL94 V-0), black
- used in conjunction with ODR tray units or fiber trays

For stripping tool 9801.20.C, please see chapter «Single parts and tools»

No. of fiber trays

61 - 80

41 - 60

21 - 40

1 - 20

calculate 2.5 m

calculate 2.1 m

calculate 1.6 m

calculate 1.3 m
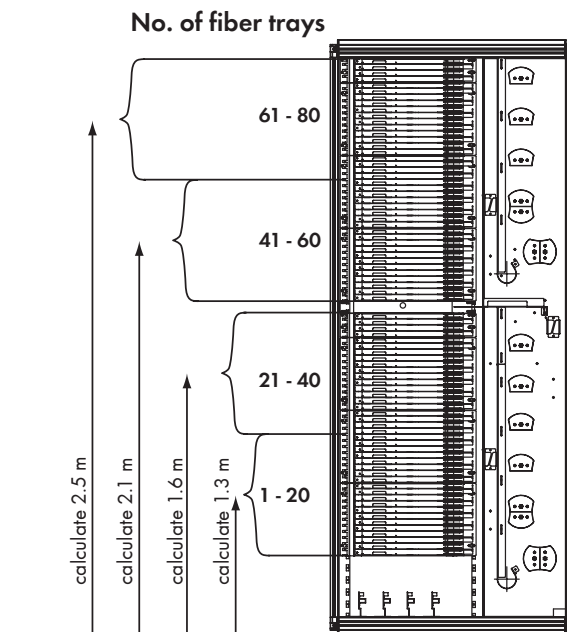
Required single lengths of conduits for calculation of the total length within an ODR. If the cable breakout area is located at the top of the rack, then read the schematic drawing conversely.

Totally required conduit lengths [1] for
ODR 600S: 130 m (with cross-connect unit)
ODR 900S: 150 m

1) One conduit to each fiber tray. By using two conduits to each fiber tray, double conduit length is required.

ODR CROSS-CONNECT UNIT
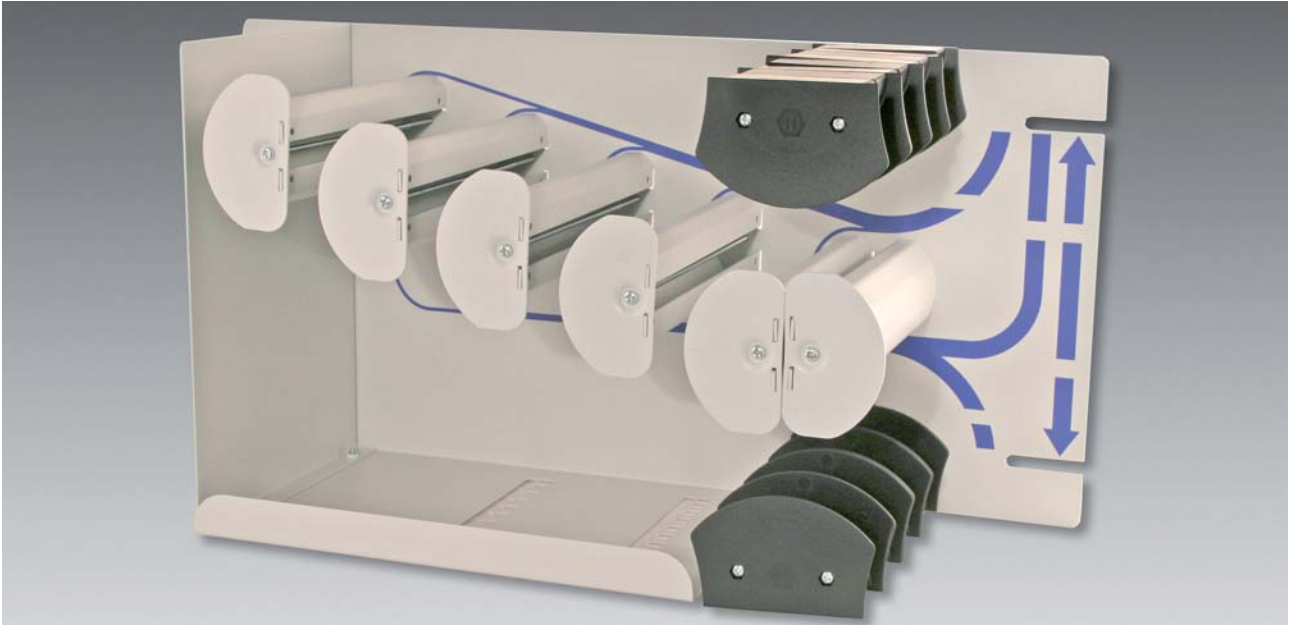
Features

- provides patchcord overlength take-up when patching between fiber trays within the ODR 600S
- dividing plates provide separation between patchcords and incoming cables
- deep mandrels provide high capacity for patchcords
- fiber bend radius control
- patchcord routing template to assist installer

- overall height 6 U
- 19" or 21" (ETS) rear mounting
- steel construction
- powder coated light grey (RAL 7035)
- fixing kit included

Ordering information

ODR cross-connect unit	Unit	Item no.
ODR-XU-6U-STA-A1	1	84004196

HUBER+SUHNER FIBER OPTICS

FIBER TRAYS

Properties
- for all connector types including SFF
- horizontally arranged adapters, side facing for laser safety
- up to 24 fibers using SFF connectivity
- insertion in ODR 600S, ODR 900S, ODU, WBC and WBH
- height: 18mm (2 fiber trays per 1 U)
- installation accessories supplied

Handling advantages
- incoming and outgoing fibers are accessed completely from the front side
- incoming loose-tubes are protected with bend-limiting conduit for safer handling
- pull-out feature with service loop offers immediate access to patching field
- hinge-down fiber tray offers immediate access to internal fibers even during service
- pigtails pre-stripped to 250µm for faster splicing
- retaining tabs on different height levels for faster insertion of fibers
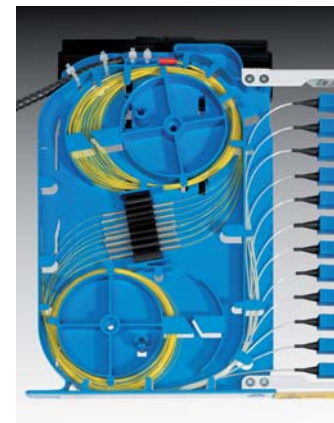
Fiber management features
- incoming fibers and pigtail fibers are stored in separate areas
- fiber storage of up to 1.5m
- bend radius limitation throughout
- central splice bridge for heat shrink and sandwich splice protectors
- storage area allows simple re-splice procedure by pulling through additional fiber
- patchcord guiding arm allows simple service loop provisioning

Identification
- colour coded fiber tray offers faster and clearer fiber identification (e.g. fiber type, PC/APC end face or line/system side), 7 colours available
- square field for numbering and laser warning label on the front side of the fiber tray
- top cover label for identification of each fiber end with small text

FIBER TRAYS FOR PIGTAIL SPLICING

Ordering code									Description
FTR									fiber tray – right handed
	B								blue – standard
	Y								yellow
	G								frey
	O								orange
	A								turquoise
	GN								green
	R								red
		H–							hinge fitted[1]
			80–						code for adapter type, please see inside back cover
				nn-					number of fibers, max. 24
					09/				fiber type - singlemode 9/125 µm
					50/				fiber type - multimode 50/125 µm[2]
					62/				fiber type - multimode 62.5/125 µm
						250			fiber construction - 250 µm
							A		heat shrink splice holder, splice protectors included
							B		sandwich splice holder (splice protectors not included)
								1	standard variant

1) Hinge not used for wall boxes; omit the «H» in the ordering code
2) OM3 fiber on request

SPLICE THROUGH FIBER TRAYS

2 x 12 fiber loose tubes from different cables can be fixed to the Fiber Tray so as to provide an effective loop-back connection. Each 12 fiber bundle is routed in different areas of the FT making coiling and identification simple. For this application no adapter plate is required.

2 loose tubes are glanded at the side of the ODR-TU to allow loose tube-loose tube splicing.

Ordering code								Description
FTR								fiber tray – right handed
	B							blue – standard
	Y							yellow
	G							grey
	O							orange
	A							turquoise
	GN							green
	R							red
		H-						hinge fitted[1]
			NX-					no adapter plate
				12-				number of splices
					250			fiber construction - 250 μm
						A		heat shrink splice holder, splice protectors included
						B		sandwich splice holder (splice protectors not included)
							1	standard variant

1) Hinge not used for wall boxes; omit the «H» in the ordering code

FIBER TRAYS FOR RUGGEDISED PIGTAIL SPLICING

Ruggedised pigtails

The fiber tray for pigtail splicing allows ruggedised pigtails to be strain relieved to a fiber tray adapter plate for direct non-connectorised splicing and low-loss terminations. Strain relief is achieved by using a pigtail clamp (PIGCP), which grips the internal aramide yarn of the ruggedised pigtail.

Two types of PIGCP are available: type 1 is intended as a retro-fit product which can be integrated with adapters and pig-tails, whereas type 2 is intended as a stand alone product without adapters or pigtails.

Features type 1

- suitable for ST footprint hole
- max. 12 glands per fiber tray
- ST-SC Converter supplied for integration with SC, E-2000™,LX.5 and LC adapters
- threaded nut for secure anchoring
- two sizes of aramide cap
- protective boot for cable sizes 1.6 – 2.2 mm, 2.3 – 2.6 mm and 2.7 – 3.2 mm
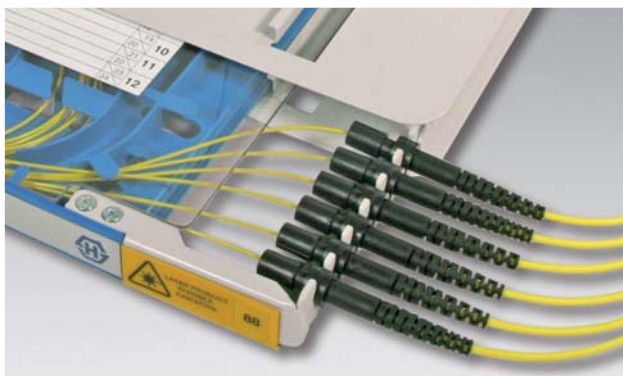
Features type 2

- slotted fixing method for fast installation
- compact design allows 16 glands per fiber tray
- no threaded nut required
- two sizes of aramide cap
- protective boot for cable sizes 1.6 – 2.2 mm, 2.3 – 2.6 mm and 2.7 – 3.2 mm

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

FIBER TRAYS FOR RUGGEDISED PIGTAIL SPLICING

Ordering code							Description
FTR							fiber tray – right handed
	B						blue – standard
	Y						yellow
	G						grey
	O						orange
	R						red
	A						turquoise
	GN						green
		H-					hinge fitted[1]
			PTG1–				PIGCP type 1 (FST shape pigtail glands fitted with screw thread), max. 12
			PTG2–				PIGCP type 2 (small pigtail glands supplied with slotted fixing), max 16
				8-			8 glands supplied (type 1 or 2)
				12-			12 glands supplied (type 1 or 2)
				16-			16 glands supplied (type 2 only)
					nn-		number of splices [2]
					1.6/		1.6 mm – 2.2 mm cable type for PIGCP glands
					2.3/		2.3 mm – 2.6 mm cable type for PIGCP glands
					2.7/		2.7 mm – 3.2 mm cable type for PIGCP glands (suitable for 1.7 mm duplex also)
						250	250 μm pigtails stripped from 900 μm, max.24 splices
						900	900 μm splicing. Use "C" type heat shrink splice holder, max. 12 splices
						A	heat shrink splice holder
						B	sandwich splice holder (ANT)
						C	heat shrink splice holder large for 900 μm fibers
						1	standard variant

1) Hinge not used for wall boxes; omit the «H» in the ordering code
2) PIGCP can also be used with 1.7 mm duplex cable

RUGGEDISED PIGTAIL SPLICING ACCESSORIES

type 1

Description	Unit	Item no.
pigtail gland universal PIGCP-UNI-2.8-A1	1	84004253

- suitable for integration into fiber trays already populated with either ST, SC, E-2000™, LX.5 or LC adapters.
- supply content as shown

type 2

Description	Unit	Item no.
pigtail gland slotted type PIGCP-SLT-1.6-3.2-A1	1	84023452

- suitable for fiber trays where only glands will be integrated.
- recommended type for faster installation and higher density
- supply content as shown
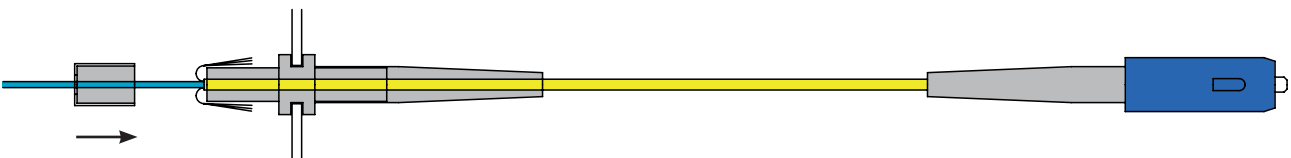
SPLITTER MODULES

- fiber trays with integrated, high-quality splitters and pre-terminated fiber ends
- side facing orientation of adaptors for high laser security
- fast access to fibers and trays by telescopic runner
- splitter modules available in 7 colours
- access identification by sealing
- splitter configuration up to 1:32 per height unit

Ordering code										Description
FTR										fiber tray with splitters
	B									blue
	Y									yellow
	G									grey
	O									orange
	A									turquoise
	GN									green
	R									red
		H-								hinge fitted
			70/							input with connector: code for adapter type, please see inside back cover
				81-						output with connectors: code for adapter type, please see inside back cover
					01x					number of splitter per module
						1x32-				splitter configuration 1x2, 1x8, 1x16, 1x32
							EE			equal split
							90			unequal split 70:30, 80:20, 90:10
								01-		singlemode fiber 9/125 µm
									01	dual window 1310 nm and 1550 nm
FTR	**B**	**H-**	**70/**	**81-**	**01x**	**1x32-**	**EE**	**01-**	**01**	**ordering example**

FIBER TRAY ACCESSORIES

	Description	Unit	Item no.
1	splice protectors for 900 µm (Ø 2.6 × 45 mm) PS-15-45-12	12	84004455
2	splice protectors for 250 µm (Ø 1.5 × 40 mm) PS-15-40-12	12	84004468
3	ANT sandwich splice protectors for 250 µm (1.2 × 3.2 × 30 mm) SPLPR-SW-30	150	84005554

HUBER+SUHNER FIBER OPTICS

M3K AND M3KP – POINT-TO-POINT CABLING SYSTEM

fiber tray and loose tube

M3K

M3KP
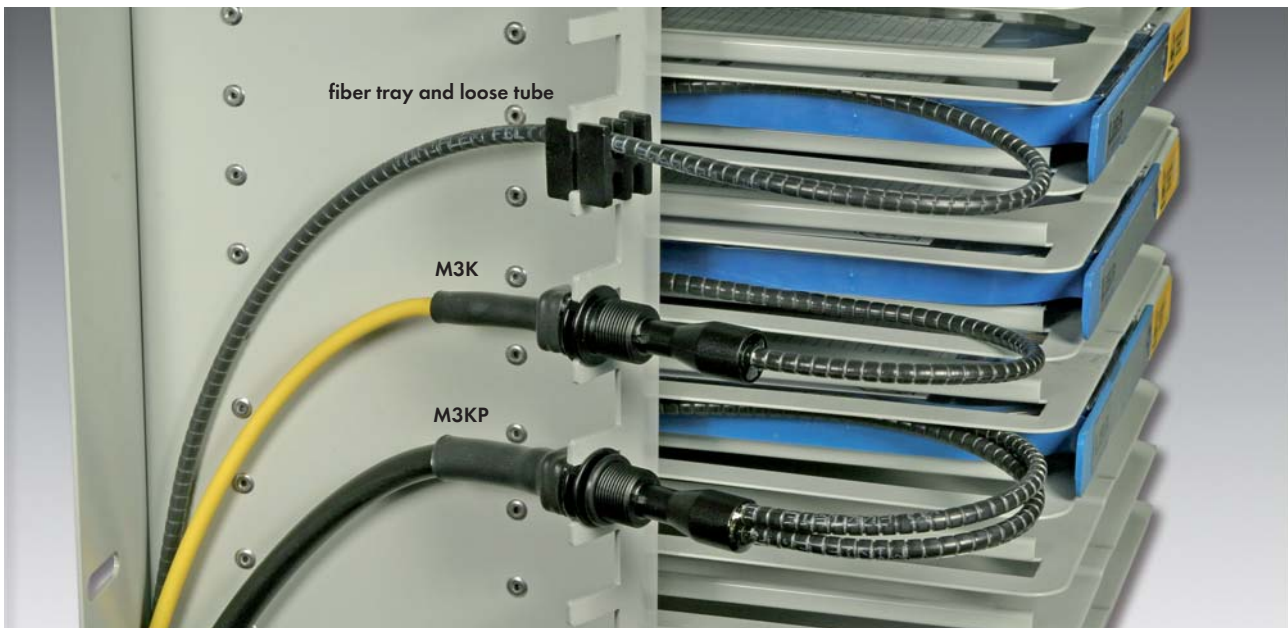
Pre-terminated and factory tested the M3K assembly is loaded into a LISA fiber tray unit allowing high fiber count links to be constructed on site in a matter of minutes without the need for costly and time-consuming splicing.

Both ends of the M3K assembly can be fitted to a fiber tray unit in an ODR or ODU or if preferred, a standard breakout can be used at one end for direct termination to in-line suite equipment racks.

Pull-socks can be fitted to either end of the M3K assembly (not FT end of M3KP) and offer complete protection when routing through duct system or simply storing under floor prior to installation. MASTERLINE end can be housed internally within LISA 19" MASTERLINE CTBs for well protected rack-to-rack fiber links or used for patching to the front side of customer equipment.

M3KP is a variant of the M3K allowing 24 fibers to be terminated in a single fiber tray by using 250 µm fibers and SFF connectivity, such as LX.5 and LC.

Features
- reduces on-site installation time
- supplied ready-to-install
- all connector types available
- up to 12 × 1.7 mm ruggedised fibers using M3K
- up to 24 × 250 micron fibers using M3KP
- pull-sock can be fitted for pulling through ducting systems
- integrates seamlessly with enclosures housing fusion spliced fiber trays
- improved protection of fiber break-outs

direct fixation to rack/equipment

termination to fiber panel (CTB) in rack

loose tube cable (line)
patchcord
cable between M3K and system rack
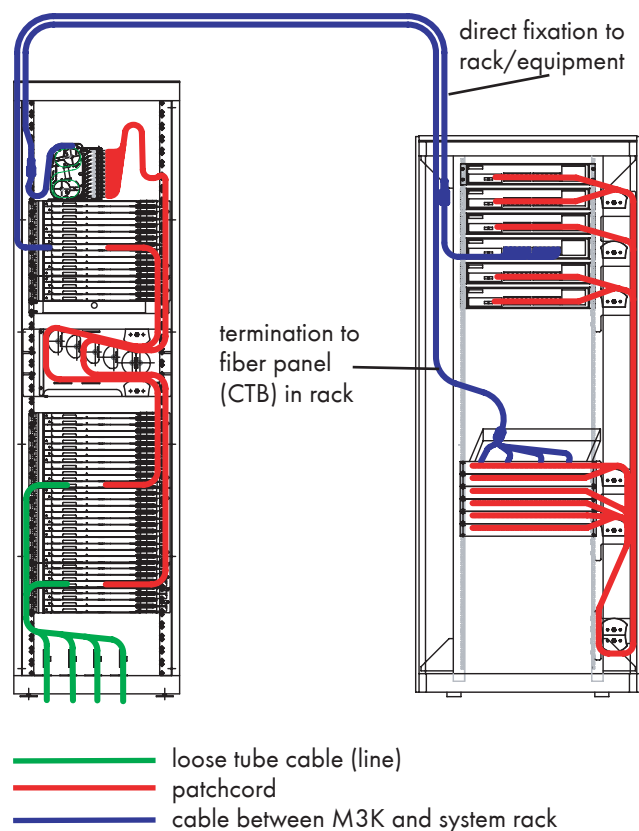
M3K – FOR UP TO 12 FIBERS

Ordering code								Description
M3K								ruggedised 1.7 mm tails
	1							cable terminated both ends
	5							cable terminated at one end only
		1 –						singlemode 9/125 µm
		5 –						multimode 50/125 µm
		6 –						multimode 62.5/125 µm
			nn-					number of fibers, max. 12 fibers
				4				LSFH jacket, glas-armoured ≤ 12 fibers ... H(ZN)H...
					E-			outer jacket yellow (standard singlemode)
					D-			outer jacket orange (standard multimode)
						end A		
				80				code for adapter type, please see inside back cover
					D			MASTERLINE classic breakout
						end B		
				80				code for adapter type, please see inside back cover
						A –		fiber tray fitted
						B –		pullsock fitted, fiber tray supplied loose
							XXX	total length of the cable between glands (m)

Standard MASTERLINE breakout length, unless specified by customer

Fiber no.	Length [mm]	Fiber no.	Length [mm]	Fiber no.	Length [mm]
1	1250	5	990	9	730
2	1185	6	925	10	665
3	1120	7	860	11	600
4	1055	8	795	12	535

For patchcords please see chapter «Connectivity»

M3KP – FOR 16 UP TO 24 FIBERS

Ordering code										Description
M3KP										primary coated 250/900 µm
	1									cable terminated both ends
	5									cable terminated at one end only
		1 –								singlemode 9/125 µm
		5 –								multimode 50/125 µm
		6 –								multimode 62.5/125 µm
			nn-							number of fibers 16 - 24
				4						LSFH jacket, glass-armoured ≤ 12 fibers ... H(ZN)H...
				5						LSFH jacket, glass-armoured ≤ 24 fibers ... H(ZNG)H...
					E-					outer jacket yellow (standard singlemode)
					D-					outer jacket orange (standard multimode)
						end A				
						80				code for adapter type, please see inside back cover
							D			MASTERLINE classic breakout
							end B			
							80			code for adapter type, please see inside back cover
								A –		fiber tray fitted
									XXX	total length of the cable between glands (m)

Standard MASTERLINE breakout length, unless specified by customer

Fiber no.	Length [mm]	Fiber no.	Length [mm]
1-3	1140	13-15	840
4-6	1065	16-18	765
7-9	990	19-21	690
10-12	915	22-24	615

For patchcords please see chapter «Connectivity»

WAN – DUCTING

WAN - Ducting
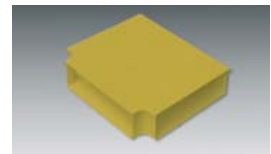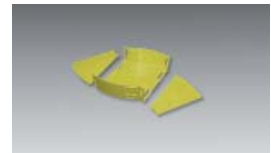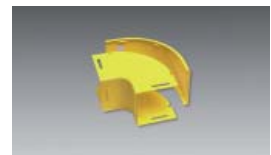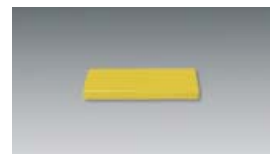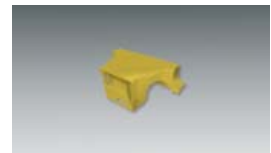
OVERVIEW DUCTING

The cable ducting system guarantees a secure and stress-free fiber management channel between different FO distribution points.

All components have compatible ducting accessories (Tees, Elbows, Crosses etc.) to ensure a minimum bend radius of 30 mm. Covers are available for all individual components to protect cables from getting damaged. Flexible tubes and vertical ducting provide access to termination units in racks. A range of components are available, enabling the system to be easily installed in both, raised floor or overhead applications.

Features

- minimal bend radius 30 mm
- UV light resistant
- halogen free (Noryl)
- flame-retardant material (UL94 V-0)
- ease of assembly
- able to interface to other brands
- cable protection with cover
- many component types such as tee pieces, elbows and reducing adapters
- resistant to sagging even under heavy load

Recommended cable diameter and max. capacity in the corresponding duct.

Size in mm Size in inches	Cable Ø mm	Capacity in straight duct
30 × 30 mm 1.25″ × 1.25″	3 2 – 2.4 1.6 – 2	45 55 90
50 × 50 mm 2″ × 2″	3 2 – 2.4 1.6 – 2	120 145 240
100 × 50 mm 4″ × 2″	3 2 – 2.4 1.6 – 2	280 350 570
100 × 100 mm 4″ × 4″	3 2 – 2.4 1.6 – 2	500 630 1000
220 × 100 mm 8″ × 4″	3 2 – 2.4 1.6 – 2	800 1000 1650
300 × 100 mm 12″ × 4″	3 2 – 2.4 1.6 – 2	1650 2100 3400

- variety of sizes, 5 widths: 30, 50, 100, 220 and 300 mm
- duct length: 2000 mm (standard)

DUCTING PLANNING

HUBER+SUHNER offer extensive planning of optical distribution rack configurations, cabling concepts and cable ducting. When floor plans and connection requirements are supplied, we can produce a detailed schematic using library building blocks and CAD layouts. In doing so, our aim is to produce the most economical and future proofed structure of fiber optic networks, so that no unnecessary cross-routing

occurs. Such a designed system saves costs and time during purchasing, installation, expansion and maintenance.

Our offer contains all required information such as part lists of ducting components, cable and patchcord lengths, ducting layouts and detailed configurations of the optical distribution racks.

Example of a layout with overhead ducting system
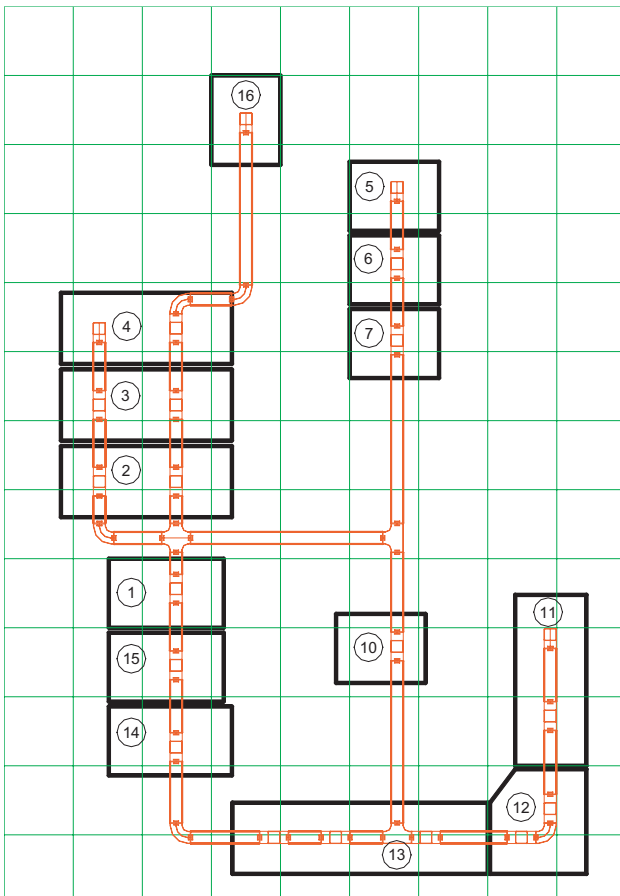
Example of the same rack layout, but with underfloor ducting system

WAN - Ducting
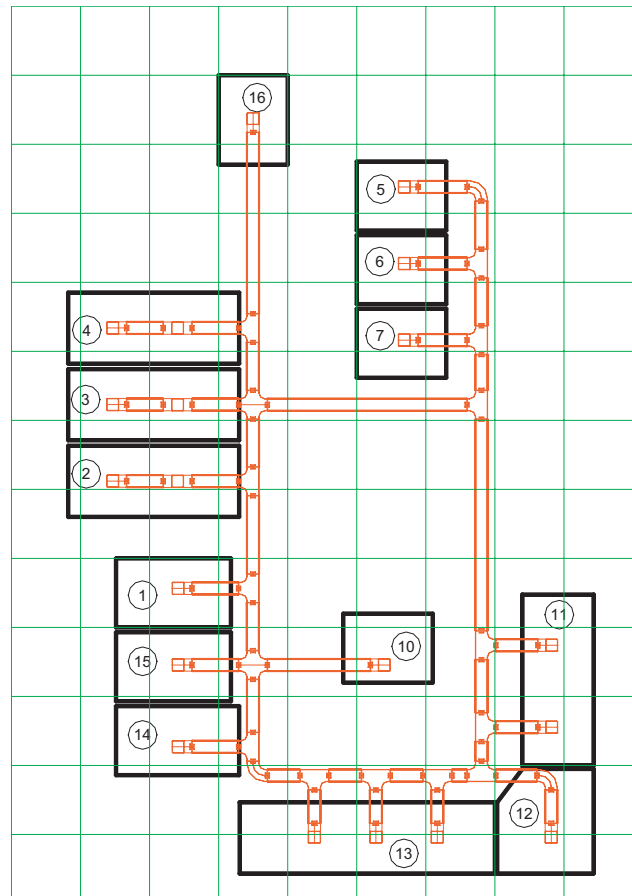
STRAIGHT DUCTS

Duct and cover	Unit	Item no.
50 × 50 mm, L 2000 mm, slotted	1	TC1279-81XA
30 × 30 mm, L 2000 mm, slotted	1	TC1279-83XA
300 × 100 mm, L 2000 mm, unslotted	1	TC1279-275A

Feature
• cover has to be snapped on both sides
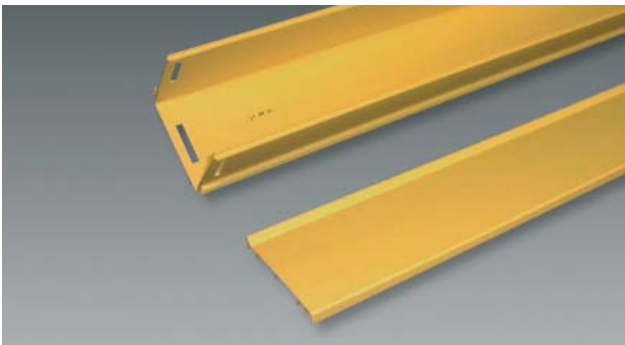
Duct and hinged cover	Unit	Item no.
220 × 100 mm, L 2000 mm, slotted	1	TC1279-21A
100 × 100 mm, L 2000 mm, slotted	1	TC1279-23A
100 × 50 mm, L 2000 mm, slotted	1	TC1279-223A

Feature
• 4 hinges for individual positioning included
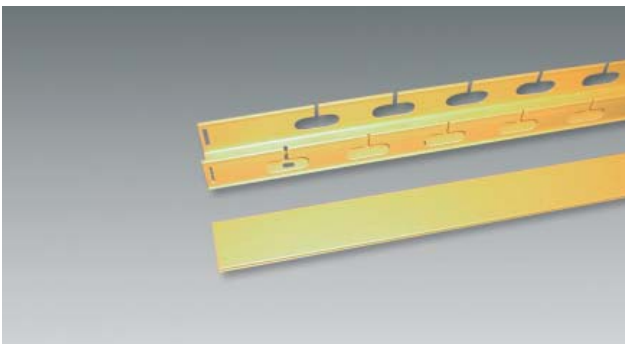
Duct with side facing slots and cover	Unit	Item no.
100 × 100 mm, L 2000 mm, slotted	1	TC1279-23SLXA
50 × 50 mm, L 2000 mm, slotted	1	TC1279-81SLXA
30 × 30 mm, L 2000 mm, slotted	1	TC1279-83SLXA

Features
• for vertical drops or inside rack applications to allow cables through the side of the duct
• slotted ducts with multi-part lids are also available for easier drop-offs
• 4 hinges for individual positioning included
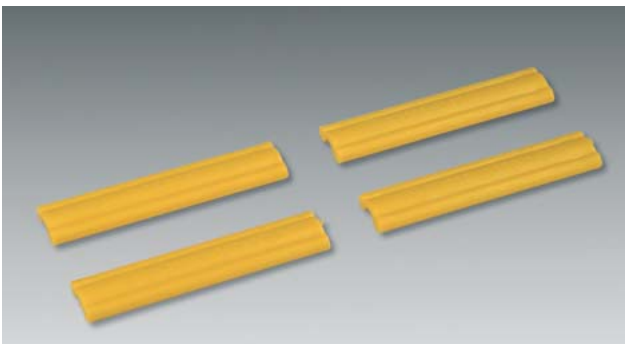
Hinges for hinged cover	Unit	Item no.
hinges	4	TC1279-43KIT

Features
• additional hinges are required when the straight ducts are cut into shorter lengths
• 2 hinges per duct part recommended

Definition
«slotted» means that the duct ends are slotted for connection with joiners for slotted duct ends. For «unslotted» duct ends joiners for unslotted ends are required.

HUBER+SUHNER FIBER OPTICS

JOINERS AND VERTICAL TEES

Joiners in conjuction with slotted duct ends	Unit	Item no.
for 220 mm duct	1	TC1279-25
for 100 mm duct	1	TC1279-27
for 100 × 50 mm duct	1	TC1279-226
for 50 mm duct	1	TC1279-73
for 30 mm duct	1	TC1279-98

Features
- to snap together duct components and straight ducts
- joiners simply snap into the slots of duct ends
- for straight ducts cut to length, new slots can be made with a suitable slotting tool
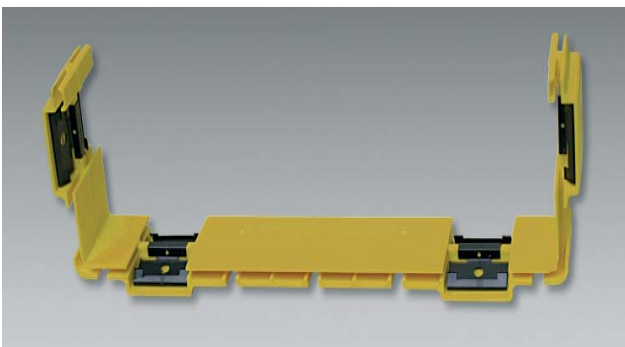
Joiners in conjuction with unslotted duct ends	Unit	Item no.
for 300 mm duct	1	TC1279-287A
for 220 mm duct	1	TC1279-250A
for 100 mm duct	1	TC1279-248A
for 100 × 50 mm duct	1	TC1279-258A

Features
- for connection of duct parts
- clamps hold the unslotted duct ends
- to remove the clamps rotate the screws
- also for slotted duct ends
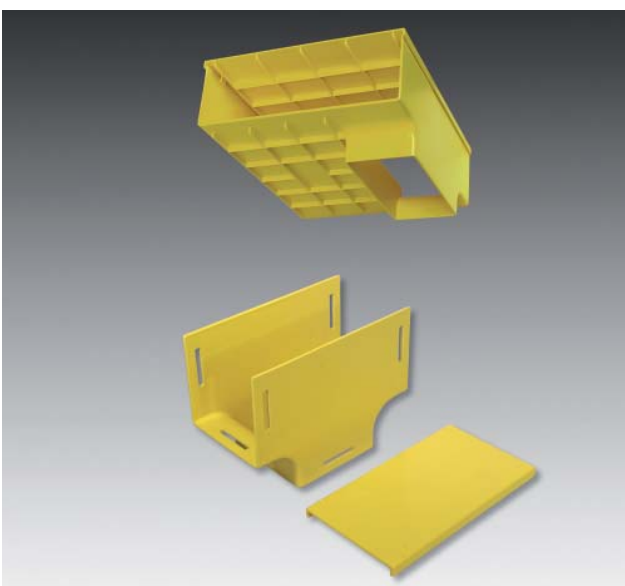
Vertical tees with cover	Unit	Item no.
300 mm, 220 x 100 mm, unslotted	1	TC1279-277A
220 mm, 100 x 100 mm, slotted	1	TC1279-11A
100 x 50 mm, 100 x 50 mm, slotted	1	TC1279-228A
100 mm, 100 × 100 mm, slotted	1	TC1279-63A
50 mm, 50 × 50 mm, slotted	1	TC1279-145A

Features
- to drop cables vertically from horizontal routes into racks
- slotted tees are used where cables are already in place
- delivered with cover

HORIZONTAL TEES AND CROSSES
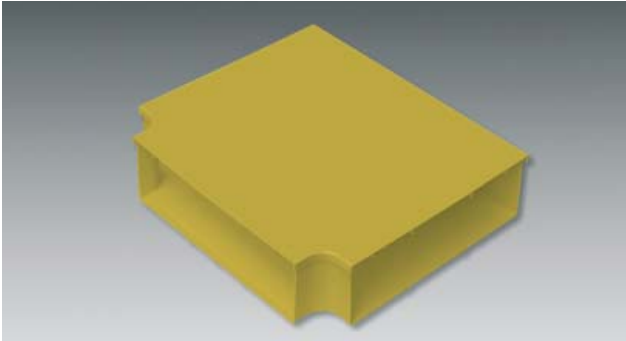
Horizontal tees with cover	Unit	Item no.
300 mm, unslotted	1	TC1279-279A
220mm, slotted	1	TC1279-01A
220 mm, 220 - 100 mm, slotted	1	TC1279-09A
100 mm, slotted	1	TC1279-03A
100 × 50 mm, slotted	1	TC1279-224A
50 mm, slotted	1	TC1279-75A
30 mm, slotted	1	TC1279-115A

Features
- used to branch off the main route
- delivered with cover
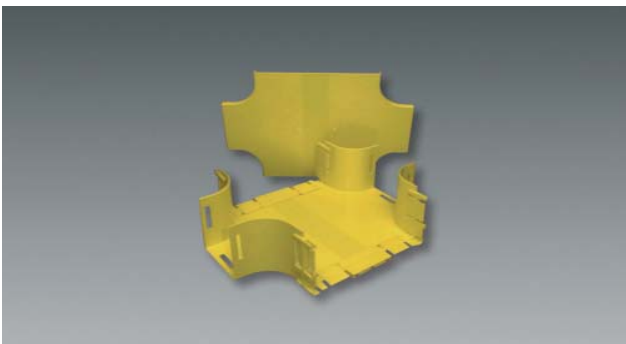
Horizontal crosses with cover	Unit	Item no.
300 mm, unslotted	1	TC1279-300A
220 mm, slotted	1	TC1279-61A
220 - 100 mm, slotted	1	TC1279-65A
100 mm, slotted	1	TC1279-71A
100 - 50 mm, slotted	1	TC1279-234A
50 mm, slotted	1	TC1279-139A

Features
- horizontal crosses are used to branch off the main route
- delivered with cover.

HUBER+SUHNER FIBER OPTICS

HORIZONTAL ELBOWS AND CENTERING ADAPTERS
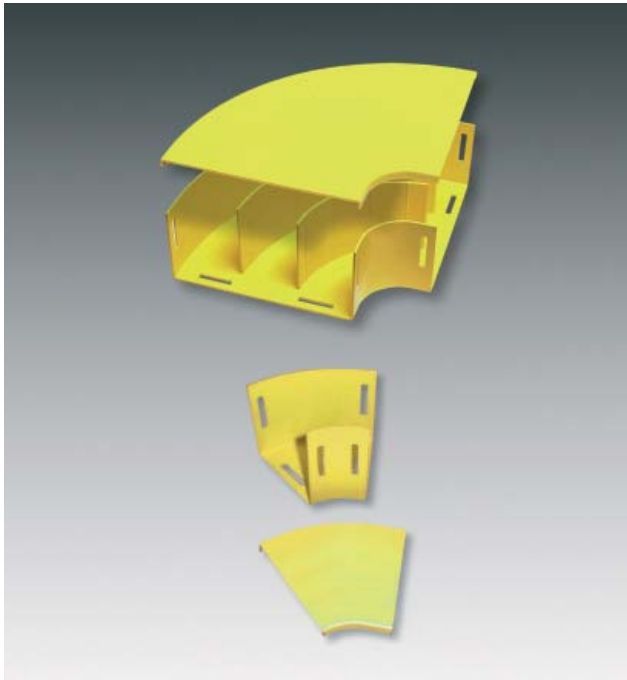
Horizontal elbows with cover	Unit	Item no.
30°, 220 mm, slotted	1	TC1279-29-30A
30°, 100 mm, slotted	1	TC1279-31-30A
30°, 50 mm, slotted	1	TC1279-77-30A
45°, 220 mm, slotted	1	TC1279-29-45A
45°, 100 mm, slotted	1	TC1279-31-45A
45°, 50 mm, slotted	1	TC1279-77-45A
90°, 300 mm, unslotted	1	TC1279-304KIT
90°, 220 mm, slotted	1	TC1279-29A
90°, 100 x 50 mm, slotted	1	TC1279-269A
90°, 100 mm, slotted	1	TC1279-31A
90°, 50 mm, slotted	1	TC1279-77A
90°, 30 mm, slotted	1	TC1279-137A

Features
- to change the direction of horizontal routes
- delivered with cover
- other configurations available on request
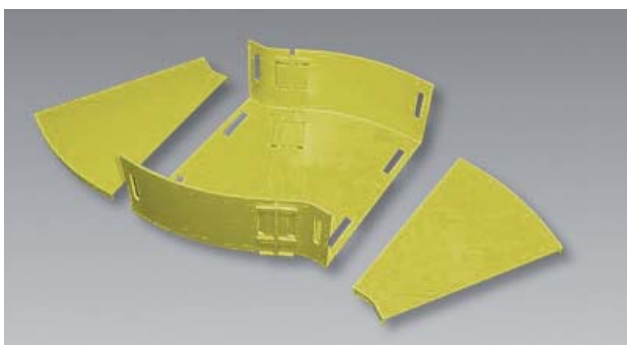
Horizontal centering adapters with cover
- used to provide a method of aligning two ducts
- use two horizontal elbows 30° and a joiner

VERTICAL ELBOWS

Vertical elbows with cover	Unit	Item no.
30° down, 220 mm, slotted	1	TC1279-123-30A
30° up, 220 mm, slotted	1	TC1279-125-30A
30° down, 100 mm, slotted	1	TC1279-111-30A
30° up, 100 mm, slotted	1	TC1279-113-30A
45° down, 300 mm, unslotted	1	TC1279-285A
45° up, 300 mm, unslotted	1	TC1279-283A
45° down, 220 mm, slotted	1	TC1279-123-45A
45° up, 220 mm, slotted	1	TC1279-125-45A
45° down, 100 mm, slotted	1	TC1279-111-45A
45° up, 100 mm, slotted	1	TC1279-113-45A
45° down, 50 mm, slotted	1	TC1279-87-45A
90° down, 300 mm, unslotted	1	TC1279-296KIT
90° up, 300 mm, unslotted	1	TC1279-298KIT
90° down, 220 mm, slotted	1	TC1279-123A
90° up, 220 mm, slotted	1	TC1279-125A
90° down, 100 x 50 mm, slotted	1	TC1279-236A
90° up, 100 x 50 mm, slotted	1	TC1279-246A
90° down, 100 mm, slotted	1	TC1279-111A
90° up, 100 mm, slotted	1	TC1279-113A
90° down, 50 mm, slotted	1	TC1279-87A
90° up, 50 mm, slotted	1	TC1279-143A
90° down, 30 mm, slotted	1	TC1279-135A

Features
- as a direction changing of branchings to racks
- to connect horizontal routes at different heights or to allow the fiber path to be raised or lowered avoiding obstacles

PATCHCORD STORAGE LOOPS
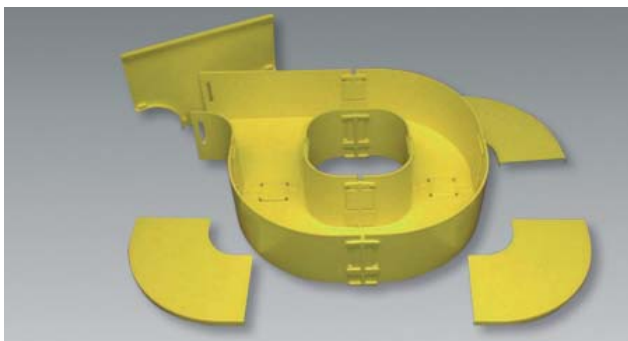
Patchcord storage loops with cover	Unit	Item no.
offset, 220 mm, slotted	1	TC1279-191KIT
offset, 100 mm, slotted	1	TC1279-192KIT
offset, 50 mm, slotted	1	TC1279-178KIT
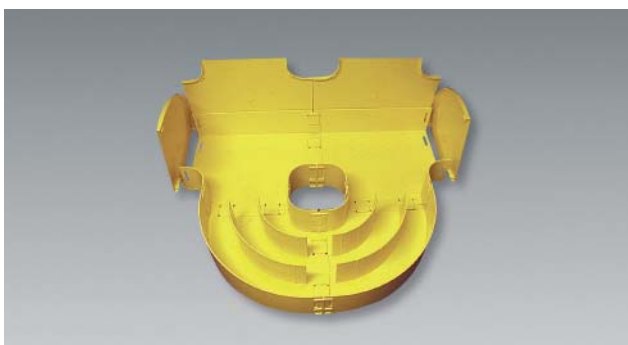
Patchcord storage loops with cover	Unit	Item no.
inline, 220 mm, slotted	1	TC1279-207KIT
inline, 100 mm, slotted	1	TC1279-208KIT
inline, 50 mm, slotted	1	TC1279-209KIT

Features
- used for safe storage of excess patchcord length
- placed in any horizontal route or inside cabinets
- offset storage loop with horizontal tee recommended, because less patchcords are accumulated at one point

application examples
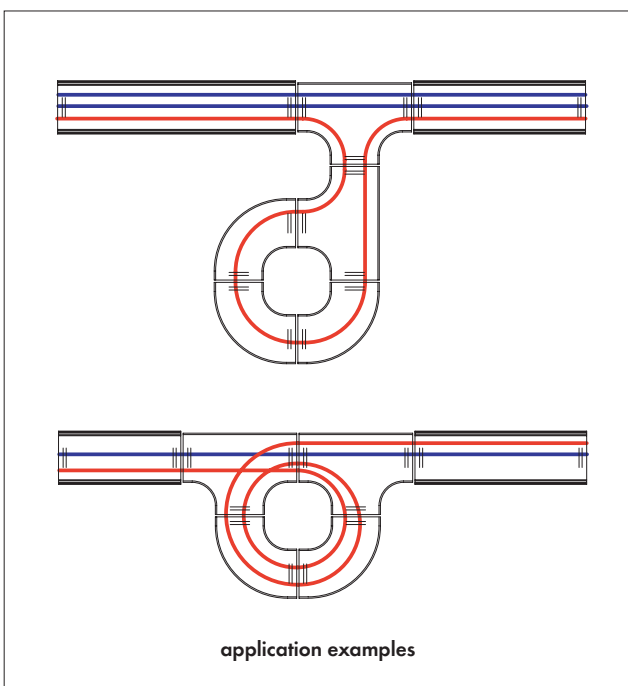
END COVERS AND ADAPTER ASSEMBLIES
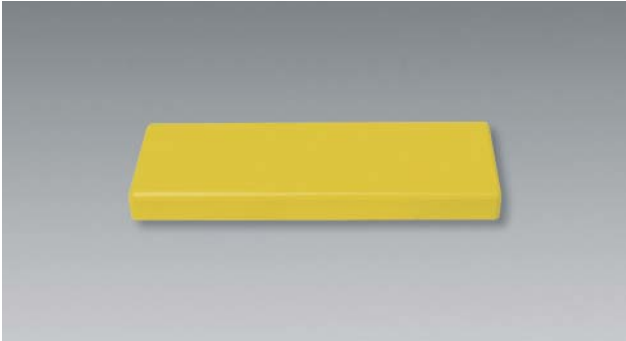
With joines for unslotted ducts	Unit	Item no.
300 mm without joiner	1	TC1279-288
220 mm without joiner	1	TC1279-252
100 mm without joiner	1	TC1279-251

Feature
• to close the end of a horizontal or vertical route
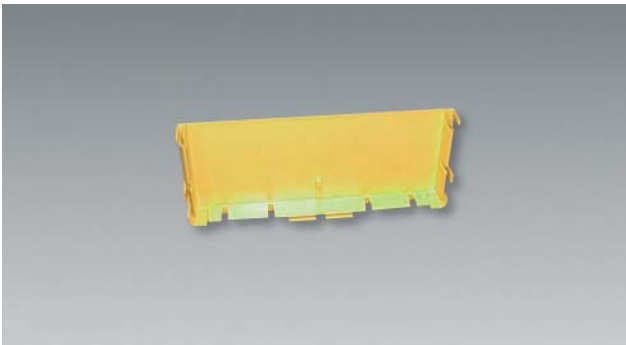
With joines for slotted ducts	Unit	Item no.
220 mm	1	TC1279-56
100 mm	1	TC1279-57

Feature
• to close the end of a horizontal or vertical route
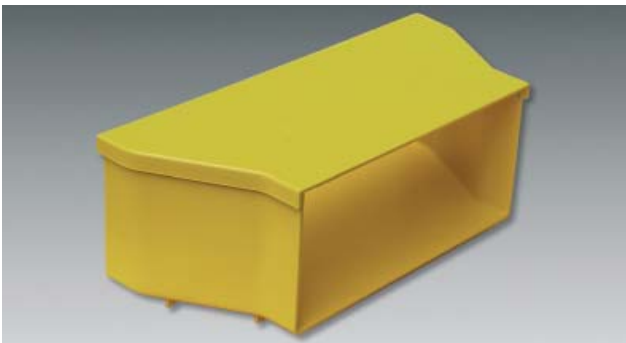
Adapter assemblies	Unit	Item no.
300 × 100 mm zu 220 × 100 mm, unslotted	1	TC1279-281A
100 × 50 mm zu 50 × 50 mm, slotted	1	TC1279-238A
100 × 100 mm zu 100 × 50 mm, slotted	1	TC1279-240A
100 × 100 mm zu 50 × 50 mm, slotted	1	TC1279-91A
50 × 50 mm zu 30 × 30 mm, slotted	1	TC1279-97A

	Unit	Item no.
right, 220 × 100 mm to 100 × 100 mm, slotted	1	TC1279-05A
left, 220 × 100 mm to 100 × 100 mm, slotted	1	TC1279-07A
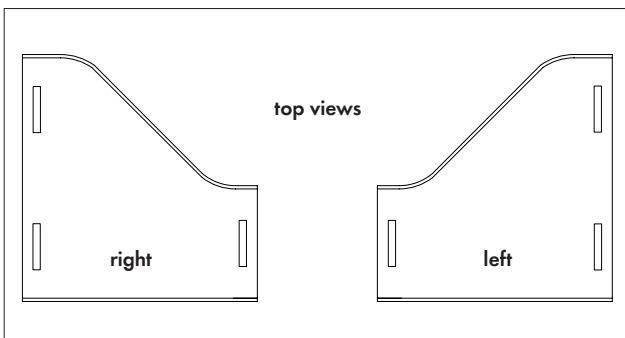
Feature
• adapter assemblies allow different size ducts to be joint together

top views

right   left

SIDE DROP-OFF KITS

TC1279-41A

TC1279-41KIT
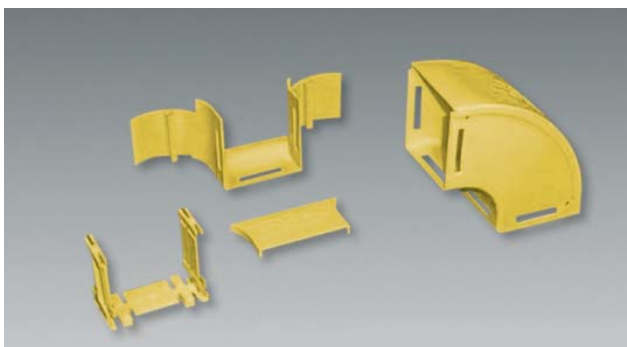
TC1279-87KIT

Side drop-off kits, 90° down	Unit	Item no.
from x 50 mm duct to ID 44 mm tube	1	TC1279-41A
from x 100 mm duct to ID 44 mm tube, incl. ramp off	1	TC1279-41KIT
from x 50 mm duct to 50 mm duct incl. joiner, breakout and elbow	1	TC-1279-87KIT

ID = inner diameter

Features

- provide different methods of allowing fiber to enter the ducting system
- sideways cut-out is required
- use tool kit TC1279-50KIT for cut-out

Side drop-off kits, 90° down	Unit	Item no.
from x 100 mm duct to 50 mm duct with square flexible tube, including ramp	1	TC1279-89KIT

Side drop-off kits, 90° down	Unit	Item no.
from x 100 mm duct to 50 mm duct, including joiner, breakout, elbow and ramp	1	TC1279-93KIT

WAN - Ducting

TOP OUTLET DROP-OFF KITS AND BREAKOUT ASSEMBLIES

Top outlet drop-off kits	Unit	Item no.
from × 100 mm duct to 100 × 100 mm duct, horizontal, unslotted	1	TC1279-290A
from × 100 mm duct to 100 × 100 mm duct, horizontal, slotted	1	TC1279-290ASL

from × 100 mm duct to 100 × 100 mm duct, down, unslotted	1	TC1279-307A
from × 100 mm duct to 100 × 100 mm duct, down, slotted	1	TC1279-307ASL

Features
- user-defined positioning on a straight duct
- reduced cross-section for cable transfer
- cover of straight duct has to be cut out

Ramp	Unit	Item no.
for x 100 mm ducts	1	TC1279-42A
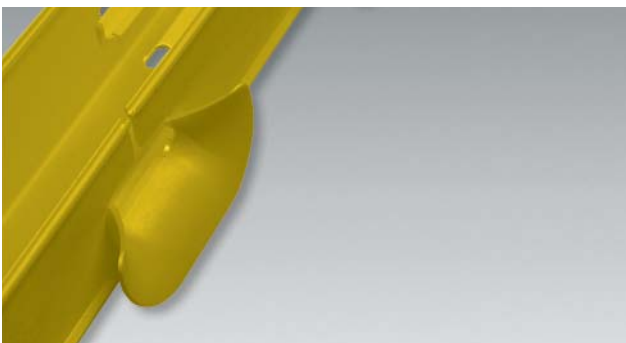
Radius guide	Unit	Item no.
for 50 mm duct with side facing slots	10	TC1279-212KIT

HUBER+SUHNER FIBER OPTICS

BREAKOUT ADAPTERS AND FLEXIBLE TUBES

Breakout adapter	Unit	Item no.
from x 50 mm duct to 50 mm square tube	1	TC1279-89A
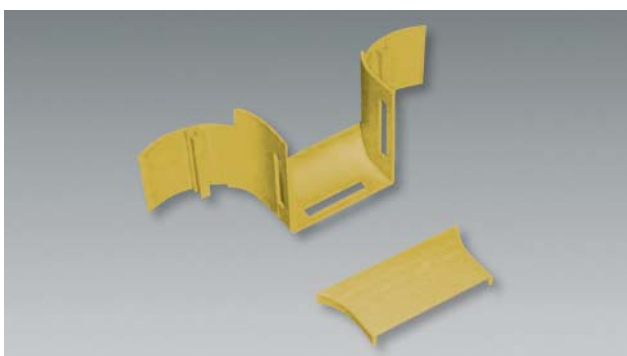
Breakout adapter	Unit	Item no.
from x 50 mm duct to 50 mm duct	1	TC1279-93A
from x 100 mm duct to 100 mm duct	1	TC1279-218A
from x 50 mm duct to 100 × 50 mm duct	1	TC1279-232A
from x 100 mm duct to 100 × 50 mm duct, including large ramp	1	TC1279-232KIT

Convoluted tube	Unit	Item no.
ID 44 mm, OD 50 mm, L 1000 mm	1	TC1279-26
ID 44 mm, OD 50 mm, L 2000 mm	1	TC1279-53
ID 32 mm, OD 38 mm, L 2000 mm	1	TC1279-68
ID 20 mm, OD 25 mm, L 2000 mm	1	TC1279-54
split, ID 17 mm, OD 20 mm, L 2000 mm	1	TC1279-100

Features
- for patchcord branchings from the duct into racks
- all tubes are convoluted or ribbed to allow adjustment
- suits the appropriate end covers and drop-offs

Adhesive clip	Unit	Item no.
for 20 mm tube 12 x 30 x 20 mm	1	TC1279-101

Features
- used to attach 20 mm convoluted tubing to any surface
- includes a mounting hole for screw fixing
- additional fixing possibility with screw

FLEXIBLE TUBES
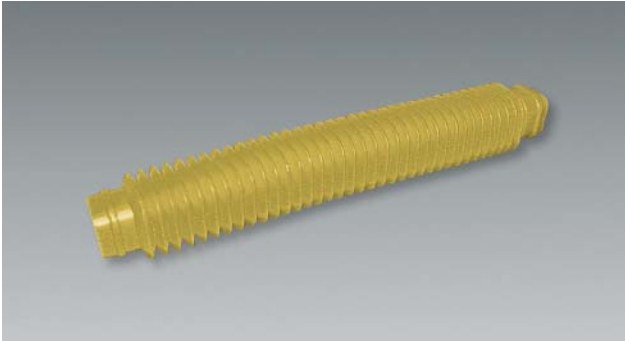
Flexible tubes	Unit	Item no.
square, 50 × 50 × 350 mm	1	TC1279-85
square, 30 × 30 × 350 mm	1	TC1279-88

Feature
• to be joined with TC 1279-89A or TC 1279-89KIT
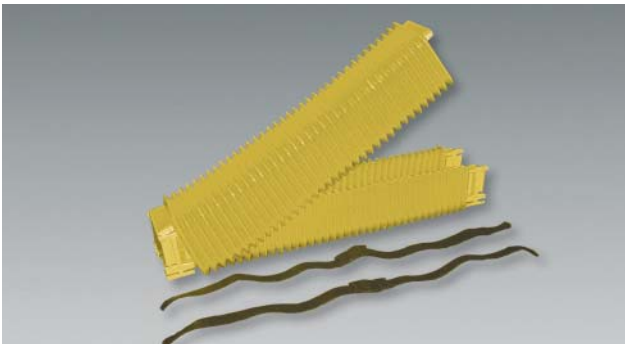
Split tube	Unit	Item no.
square, 50 × 50 × 350 mm	1	TC1279-85KIT

Features
• to be joined with any x 50 mm square duct component
• includes 2 joiners

HUBER+SUHNER FIBER OPTICS

MOUNTING MATERIAL

Mounting brackets Dimensions (W×H×D)	Unit	Item no.
for duct 300 mm 50 × 28 × 325 mm with integrated nut	1	TC1279-297
for duct 220 mm 40 × 30 × 250 mm mounting material included	1	TC1279-15A
for duct 100 mm 40 × 30 × 120 mm mounting material included	1	TC1279-16A
for duct 50 mm 20 × 25 × 68 mm mounting material included	1	TC1279-147A
for duct 30 mm 20 × 22 × 50 mm mounting material included	1	TC1279-148A

Feature
• these brackets support a duct and can be bolted to any other mounting bracket
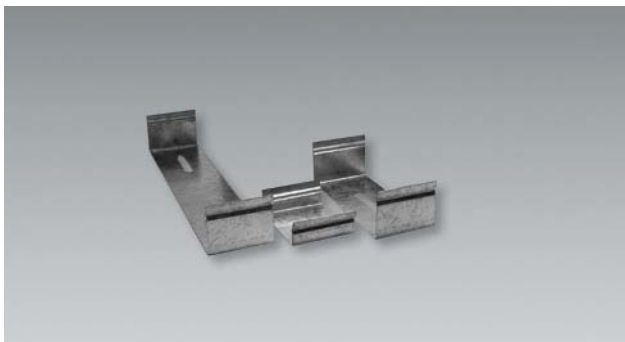
Support clip	Unit	Item no.
for 50 mm duct	1	clip1-50
for 100 mm duct	1	clip1-100
for 220 mm duct	1	clip1-220

Features
• for fast fixing of ducts with snap-in mechanism
• slot for mounting clip 6 mm width
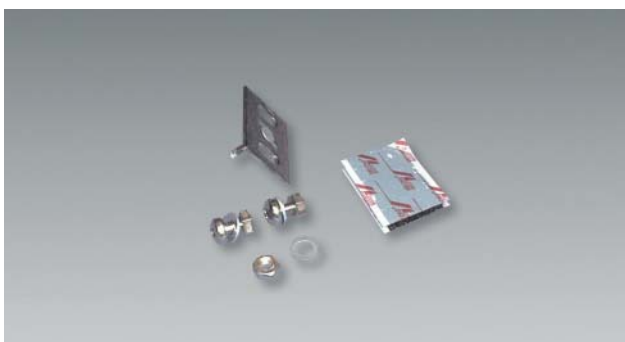
Mounting bracket kits	Unit	Item no.
mounting bracket kit 30 × 20 × 40 mm for 50 und 30 mm ducts	1	TC1279-78KIT

Feature
• for mounting in rack

MOUNTING MATERIAL
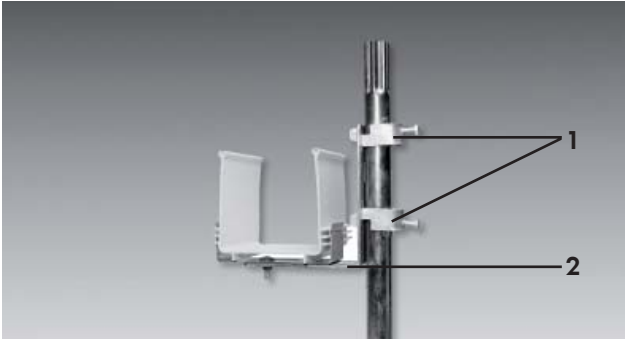
Computer floor installation		Unit	Item no.
1	bracket, Ø 20-24 mm (2 pcs. required)	1	MHC-24EC
2	holder for 50/100 mm duct	1	MH1149191
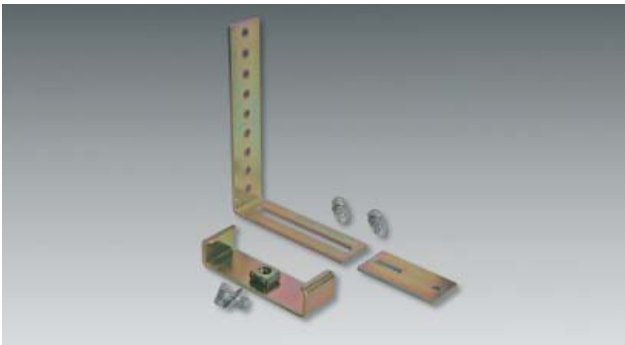
Ladder rack mounting kit	Unti	Item no.
for 100 mm duct	1	TC1279-202KIT

Features

- suitable for fixing at telescopic mounting angle for ODR 300F/600F/900F/1200F
- universal positioning of the mounting bracket
- includes mounting screws

holder

duct

rack ODR .... F
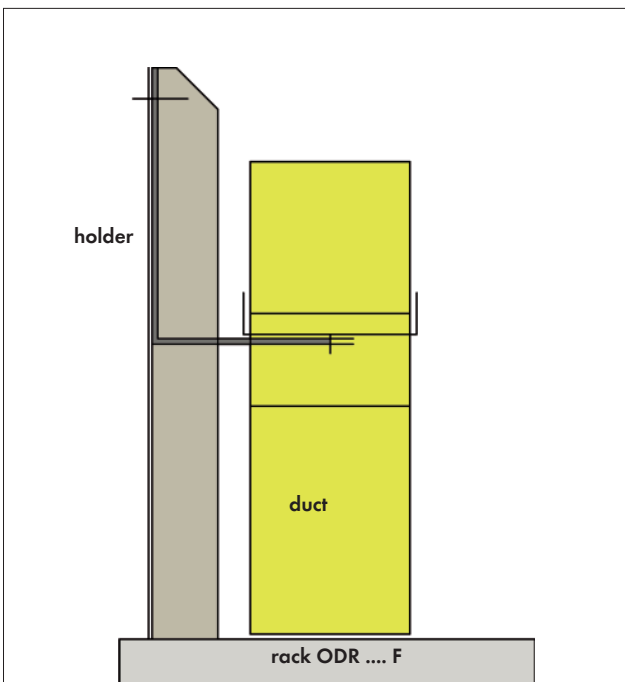
MOUNTING MATERIAL – APPLICATION EXAMPLES

rawlplug

fixing strut

duct with
mounting bracket

support bracket,
spacer and screw
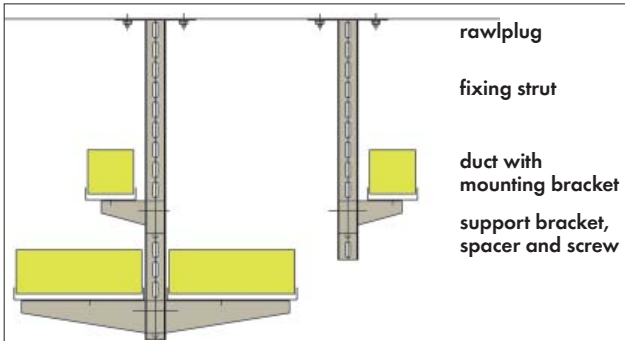
Application variant: ceiling support

raised floor
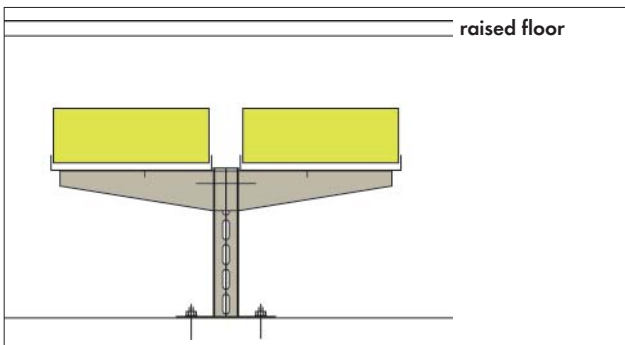
Application variant: floor support

TOOLS

Cut-out kit	Unit	Item no.
to provide side openings in 220 and 100 mm ducts 1/2" ratchet 330 × 180 × 160 mm	1 set	TC1279-50KIT

Feature
• to suite the following breakouts:
  41A, 89A, 93A, 41 KIT, 87KIT, 89KIT, 93KIT, 93DKIT, MM1KIT

Cut-out kit	Unit	Item no.
to provide side openings in 220, 100 and 100 x 50 mm ducts, 100 mm breakout, 400 × 210 × 225 mm	1 set	TC1279-231KIT

Feature
• suitable for: 218A, 232A

Mitre and slotting tool kit	Unit	Item no.
Cuts slots in 220 und 100 mm duct ends, incl. 1/2" ratchet, mitre box and saw 355 × 130 × 170 mm	1 set	TC1279-51KIT

Feature
• suitable for standard joiners

HUBER+SUHNER FIBER OPTICS

TOOLS

Side slotting tool kit	Unit	Item no.
to cut lateral slots in 100 × 50 mm duct ends, 110 × 115 × 170 mm	1 set	TC1279-230A

Feature
• suitable for standard joiners

Slotting tool and mitre box	Unit	Item no.
for slots in 50 und 30 mm duct ends 330 × 160 × 180 mm	1 set	TC1279-140KIT

Features
• to cut slots into duct ends to suit standard connectors
• mitre boxes ensures a true 90° cut is achieved

Slotting tool and mitre box	Unit	Item no.
for slots in 50 mm duct ends 295 × 135 × 140 mm	1 set	TC1279-118KIT

Slotting tool and mitre box	Unit	Item no.
for slots in 30 mm duct ends 380 × 85 × 330 mm	1 set	TC1279-119KIT
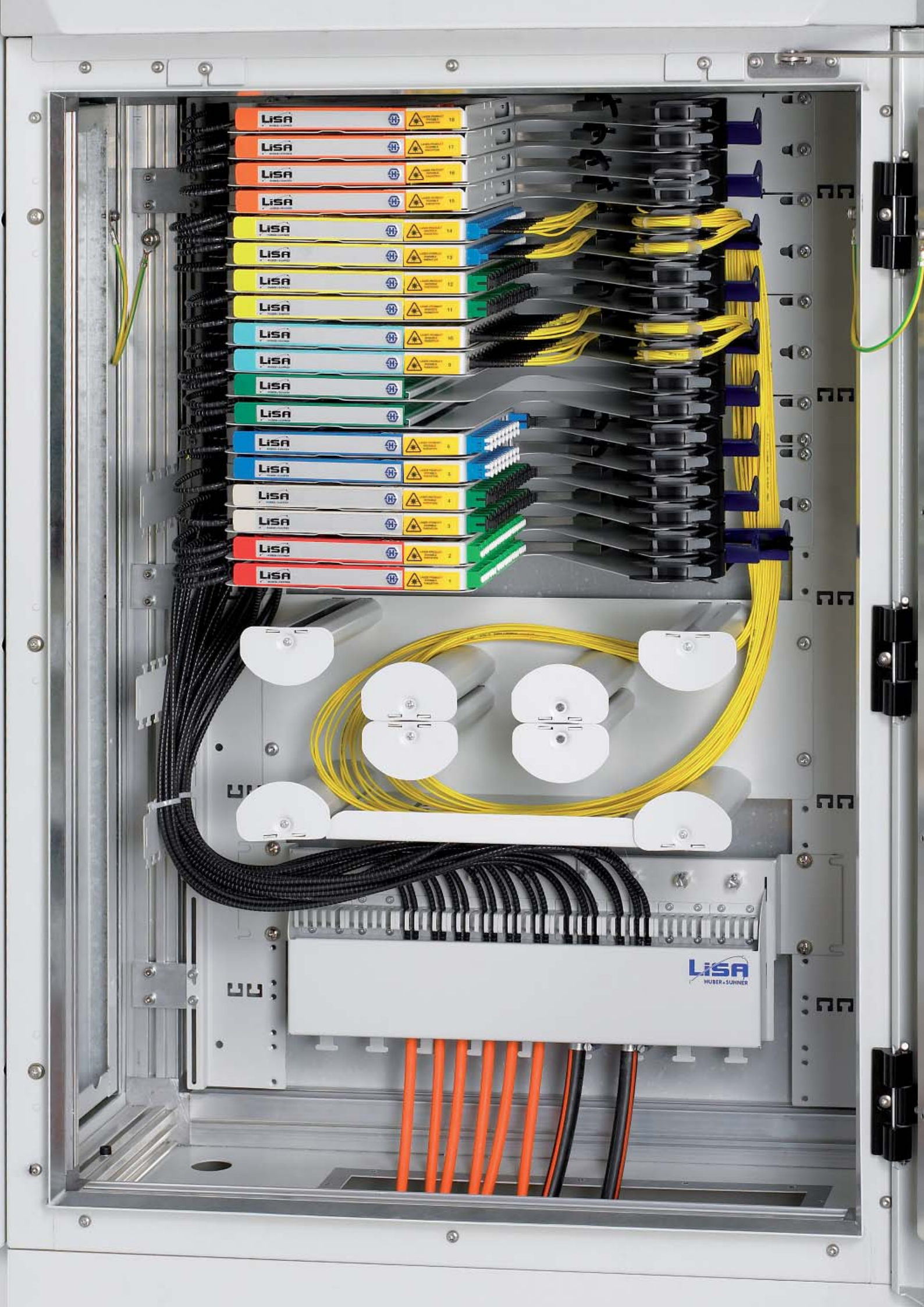
WAN – OUTSIDE PLANT
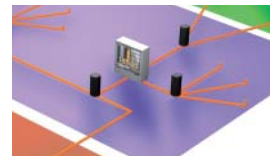
OUTSIDE PLANT

In the area of outside plant outdoor cabinets and splice closures allow proximate termination points in an access network.

splice closures

cross-connect cabinet

	Outdoor cabinet	Splice closure
max. number of fibers	816 (with standard connectors)	192 (standard mounting)
max. splice connections	816	96
permanent fiber connection of two cable ends	no	yes
max. number of branching fibers/cables	any	max. 9
fast modification of fiber connections	yes	no
fiber connections by		
splicing	yes	yes
patching	yes	no
splitting integration	yes	possible
fiber management MCM	yes	yes
SCM	yes	yes
integration of active devices	yes	no
application location overground	on the floor	in housing, at wall or at mast
underground	–	buried or in duct
protection class (IEC 60529)	IP 54	IP 67

CROSS-CONNECT CABINETS

Modern fiber optic networks using Point-to-Point or Point-to-Multi point structures require advanced distribution points for securing innovative services such as Triple Play. High-quality fiber optic connectivity relies on the increased protection offered by weather-proof outdoor cabinets.

Applications

- for Passive Optical Networks (PON) and Optical Access Networks (OAN)
- as a distribution point to network terminations
- also for mixed access technology (fiber/copper) as an Optical Node Unit (ONU)
- FTTH, FTTP and FTTB applications

plan view outdoor cabinet

HUBER+SUHNER offers **modular subunits** for installation in outdoor cabinets in FrontAccess and SideAccess technology.

Features subunits

- rear-mounted subunits for optimal access to fibers
- mounting to all 19" and ETS fixing rails
- vertical rear fixing hole pitch standard 19"
- installation of splice and splitter modules
- optimal fiber and patchcord management
- cable anchoring of jacket, central member and conduits for loose tubes

Required footprint [mm] within outdoor cabinet

LISA system	subrack	A	B	C	C
SideAccess	Standard	500	465	270	10
FrontAccess	600F	500	465	210	90
FrontAccess	900F	530	515	210	90
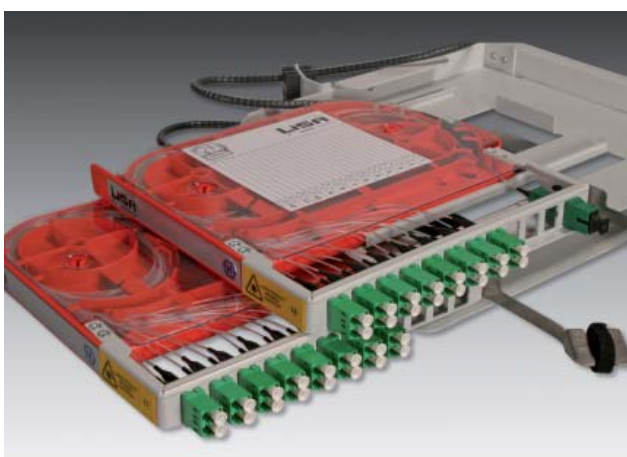
Features splitter modules

- high-quality fusion and planar coupler with low attenuation, high stability and excellent quality
- splitting configurations 1x2, 1x8, 1x16 and 1x32
- splitting ratios 50:50, 70:30, 80:20, 90:10
- inputs and outputs with connectors or for splicing
- custom-designed types on request

Splitter modules please see pages
- SideAccess   102
- FrontAccess   107
- CTB 19"   138

OVERVIEW OUTDOOR CABINETS

recommended types

Technical data				
cabinet	dimensions cabinet (W×D×H) socket (W×D×H)	0.75 × 0.4 × 1.0 m 0.75 × 0.4 × 1.06 m	1.0 × 0.5 × 1.6 m 1.0 × 0.5 × 0.74 m	1.4 × 0.5 × 1.6 m 1.4 × 0.5 × 0.74 m
	integration of active devices	no	yes[1]	yes[1]
	height for building blocks	17 U	21 U	2 × 21 U
SideAccess	max. number of fibers with splicing 12 per fiber tray 24 per fiber tray (SFF)	288 576	408 816	816 1632
	max. number of splitter modules splitter 1:8 or 1:16 splitter 1:32 [2]	24 12	34 17	68 34
FrontAccess	max. number of fibers with splicing MultiCircuit	216	384	726
	max. number of splitter modules splitter 1:8 or 1:16 [3]	18	32	64

1) 10 to 20 W/K (passive convection cooling)
2) with SFF connectors only, two fiber trays are connected to one unit
3) with SFF connectors only, module width 9 SU

Features

- weather-proofed outdoor cabinet for installation of optical distribuiton modules
- assembly of modular buidling blocks with 19" or ETSI dimensions
- removable outer housing parts without operation interruption
- door closing with locking hundle (one-way locking cylinder)

- outer surface of the door and rear wall with stripe profile for complicating the attaching of posters
- divided base plate with rubber grommets for cable entry
- glass-fiber reinforced housing made of polycarbonate, agate grey (RAL 7038)
- protection class IP 54

Detailed characteristics of the housings and specific housings on request.

OCS UNI 8 –
OUTDOOR CABINET WITH SIDEACCESS MODULES
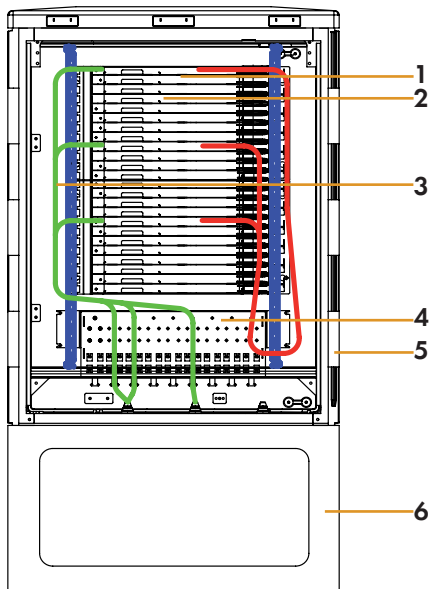
Features
- max. capacity 288 fibers with standard connectors
- divided floor plate for insertion of uncut cables
- generous cable breakout plate
- subunits modular expandable
- suitable for multi fiber management
- continuous bend radius limitation
- integrated patchcord management
- complete front mounting of all fiber optic components
- increased protection for loose tubes by means of conduits

Ordering example

Pos.	Description	Item no.	Quantity
1	tray unit - 6 U	84016903	2
2	fiber trays / splitter modules	see page 101	max. 24
3	conduit - 5 m	84014504	7
4	cable breakout plate	84014922	1
5	housing - Uni 8	on request	1
6	base - Uni 8	on request	1

Connector type	Number of splice cassettes	Number of connectors	Number of splitter fiber trays			Recommended patchcord length and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	24	288	24	24	12[1]	1.5 m / Ø 1.7 mm
small-form-factor LX.5, LC	24	576	24	24	12[1]	1.5 m / Ø 1.7 mm

1) Two splitter fiber trays are connected to one unit

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

OCF UNI 8 – OUTDOOR CABINET WITH FRONTACCESS MODULES

Features

- max. capacity 216 fibers with standard connectors
- divided floor plate for insertion of uncut cables
- generous cable breakout plate
- subunits modular expandable
- optional patchcord management
- complete front mounting of all fiber optic components
- increased protection for loose tubes by means of conduits
- suitable for MultiCircuit and SingleCircuit management
- continuous bend radius limitation

Ordering example

Pos.	Description	Item no.	Quantity
1	subrack 600F	23040046	max. 3
2	loose tube guiding kit 600F	84003530	max. 3
3	splitter and compact modules	see page 106	max. 18
4	cable mounting plate	84016555	3
5	conduit	84003340	8 m
6	patchcord management 800	84016599	4
7	cable breakout plate	84014922	1
8	housing - Uni 8	on request	1
9	bade - Uni 8	on request	1

Connector type	Number of MCM-compact modules	Number of Connectors	Number of splitter modules			Recommended patchcord length and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	18	216	18	6[1]	–	2.0 m / Ø 2.0 - 2.4 mm
small-form-factor LX.5, LC	18	216	18	18	6[2]	2.0 m / Ø 1.7 - 2.4 mm

1) For split 1:16 one splitter module 1:2 and two concatenated splitter modules 1:8 are recommended
2) For split 1:32 one splitter module 1:2 and two concatenated splitter modules 1:16 are recommended

OCS SICAB 08 –
OUTDOOR CABINET WITH SIDEACCESS MODULES
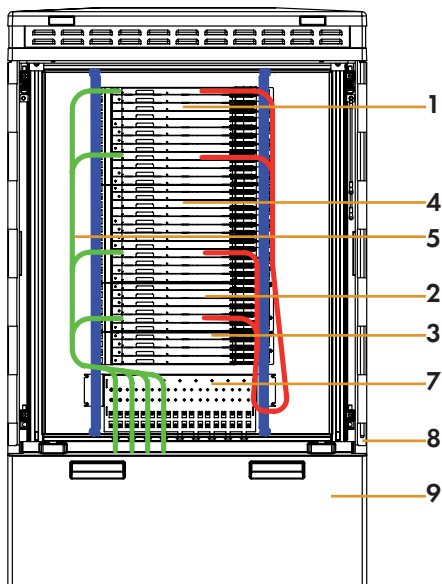
Features

- max. capacity 408 fibers with standard connectors
- divided floor plate for insertion of uncut cables
- generous cable breakout plate
- subunits modular expandable
- suitable for multi fiber management
- continuous bend radius limitation
- integrated patchcord management
- complete front mounting of all fiber optic components
- increased protection for loose tubes by means of conduits
- suitable for installation of active equipment

Ordering example

Pos.	Description	Item no.	Quantity
1	tray unit - 6 U	84016903	2
2	tray unit - 3 U	84016901	1
3	tray unit - 2 U	84016896	1
4	fiber trays / splitter modules	see page 101	max. 34
5	conduit - 5 m	84014504	11
6	cross-connect unit - 4 U	84018348	optional[1]
7	cable breakout plate	84014922	1
8	housing - SiCab 08	on request	1
9	base - SiCab 08	on request	1

1) When using one cross-connect unit, position 2 and 3 are not needed and the maximum quantity of the fiber trays/splitter modules is reduced to 24

Connector type	Number of splice cassettes	Number of connectors	Number of splitter modules			Recommended patchcord length and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	34	408	34	34	17[2]	2 m / Ø 1.7 mm
small-form-factor LX.5, LC	34	816	34	34	17[2]	2 m / Ø 1.7 mm

2) Two splitter fiber trays are connected to one unit

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

OCF SICAB 08 –
OUTDOOR CABINET WITH FRONTACCESS MODULES
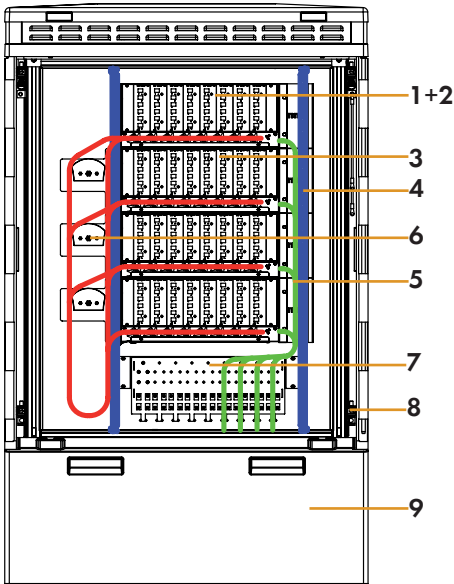
Features
- max. capacity 384 fibers with standard connectors
- divided floor plate for insertion of uncut cables
- generous cable breakout plate
- subunits modular and expandable
- optional patchcord management
- complete front mounting of all fiber optic components
- increased protection for loose tubes by means of conduits
- suitable for MultiCircuit and SingleCircuit management
- continuous bend radius limitation
- suitable for installation of active equipment

Ordering examples

Pos.	Description	Item no.	Quantity
1	subrack 900F	23040051	max. 4
2	loose tube guiding kit 900F	84003334	max. 4
3	splitter and compact modules	see page 106	max. 32
4	cable mounting plate	84016555	4
5	conduit	84003340	15 m
6	patchcord management 800	84016599	3
7	cable breakout plate	84014922	1
8	housing - SiCab 08	on request	1
9	base - SiCab 08	on request	1

Connector type	Number of MCM-compact modules	Number of connectors	Number of splitter modules			Recommended patchcord length and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	32	384	32	10[1]	–	2 m / Ø 2.0 - 2.4 mm
small-form-factor LX.5, LC	32	384	32	32	10[2]	2 m / Ø 1.7 - 2.0 mm

1) For split 1:16 one splitter module 1:2 and two concatenated splitter modules 1:8 are recommended

2) For split 1:32 one splitter module 1:2 and two concatenated splitter modules 1:16 are recommended

OCS SICAB 12 –
OUTDOOR CABINET WITH SIDEACCESS MODULES

Features

- max. capacity 816 fibers with standard connectors
- generous cable breakout plate
- subunits modular and expandable
- suitable for multi fiber management
- continuous bend radius limitation

- integrated patchcord management
- complete front mounting of all fiber optic components
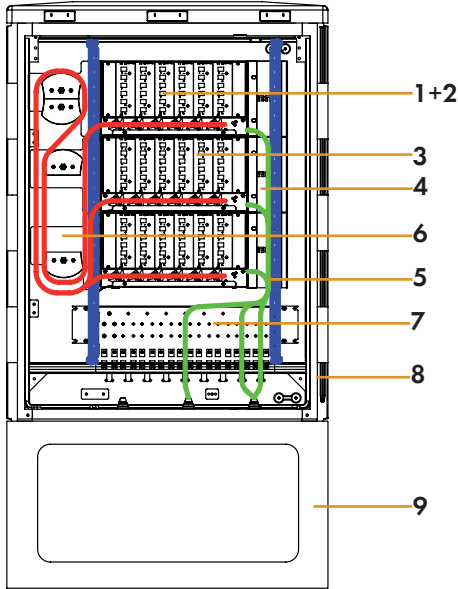- increased protection for loose tubes by means of conduits
- suitable for installation of active equipment
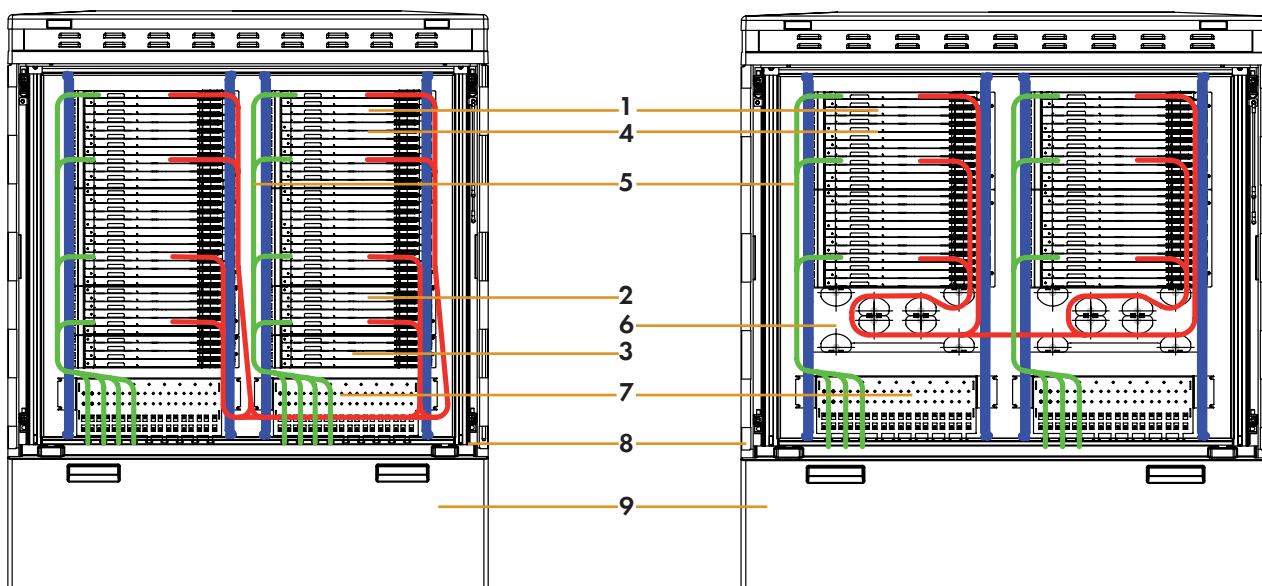
Ordering example

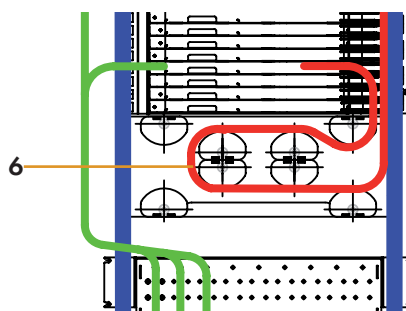| Pos.	Description	Item no.	Quantity
1	tray unit - 6 U	84016903	4
2	tray unit - 3 U	840016901	2
3	tray unit - 2 U	84016896	2
4	fiber trays / splitter modules	see page 101	68
5	conduit - 100 m conduit - 5 m	840014501 840014504	1 1
6	cross-connect unit - 4 U	84018348	optional[1]
7	cable breakout plate	84014922	2
8	housing - SiCab 12	on request	1
9	base - SiCab 12	on request	1

1) When using one cross-connect unit in each bay, position 2 and 3 are not needed and the maximum quantity of the fiber trays/splitter modules
   is reduced to 48

OCS SICAB 12 –
OUTDOOR CABINET WITH SIDEACCESS MODULES

Connector type	Number of splice cassettes	Number of connectors	Number of splitter modules			Recommended patchcord length* and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	68	816	68	68	34[1]	3 m / Ø 1.7 mm
small-form-factor LX.5, LC	68	1632	68	68	34[1]	3 m / Ø 1.7 mm

1) Two splitter fiber trays are connected to one unit

*   2.0 m for patching within one bay

In conjunction with two cross-connect units

Connector type	Number of splice cassettes	Number of connectors	Number of splitter modules			Recommended patchcord length* and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	48	576	48	48	24[2]	3 m / Ø 1.7 mm
small-form-factor LX.5, LC	48	1192	48	48	24[2]	3 m / Ø 1.7 mm

2) Two splitter fiber trays are connected to one unit

*   2.0 for patching within one bay

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

OCF SICAB 12 –
OUTDOOR CABINET WITH FRONTACCESS MODULES

Features

- max. capacity 768 fibers with standard connectors
- generous cable breakout plate
- subunits modular and expandable
- complete front mounting of all fiber optic components
- increased protection for loose tubes by means of conduits
- suitable for MultiCircuit and SingleCircuit management
- continuous bend radius limitation
- suitable for installation of active equipment
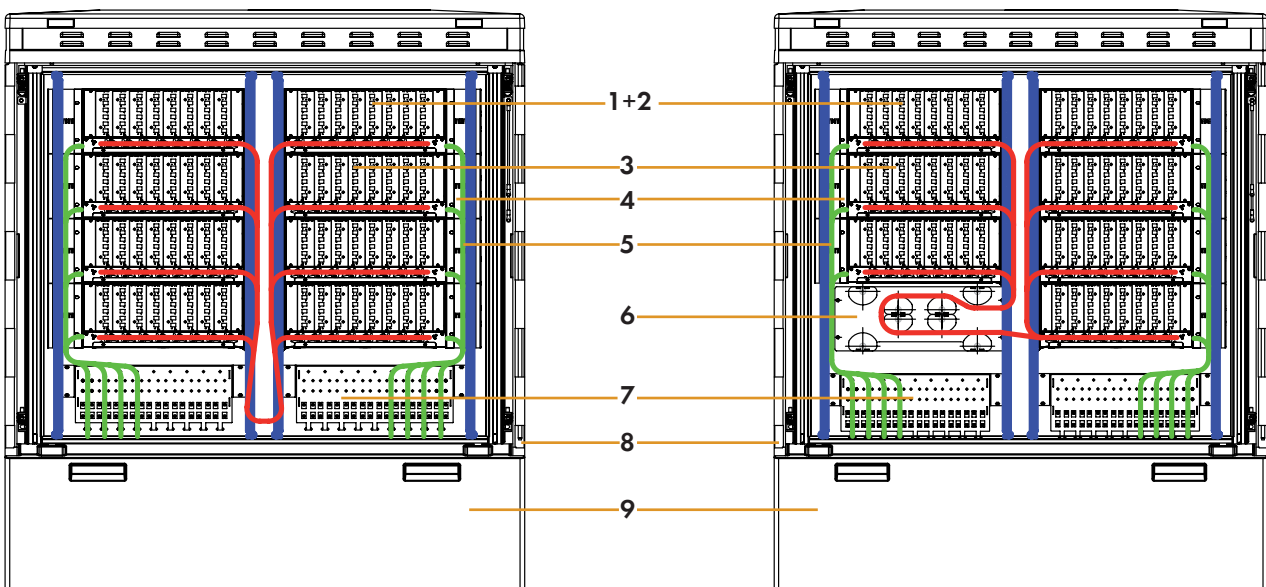
Ordering example

Pos.	Description	Item no.	Quantity
1	subrack 900F	23040051	max. 8
2	loose tube guiding kit 900F	84003334	max. 8
3	splitter and compact modules	see page 106	max. 64
4	cable mounting plate	84016555	8
5	conduit	84003340	30 m
6	cross-connect unit - 4 U	84018348	optional[1]
7	cable breakout plate	84014922	2
8	housing - SiCab 12	on request	1
9	base - SiCab 12	on request	1

1) When using one cross-connect unit, position 2 and 3 are reduced to 7 pieces and the maximum quantity of the compact/splitter modules is reduced to 56

![LiSA HUBER+SUHNER]

OCF SICAB 12 –
OUTDOOR CABINET WITH FRONTACCESS MODULES

| Connector type	Number of MCM-compact modules	Number of connectors	Number of splitter modules			Recommended patchcord length and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	64	768	64	21[1]	–	2 m / Ø 2.0 - 2.4 mm
small-form-factor LX.5, LC	64	768	64	64	21[2]	2 m / Ø 1.7 - 2.0 mm

1) For split 1:16 one splitter module 1:2 and two concatenated splitter modules 1:8 are recommended
2) For split 1:32 one splitter module 1:2 and two concatenated splitter modules 1:16 are recommended

In conjunction with one cross-connect unit

Connector type	Number of MCM-compact modules	Number of connectors	Number of splitter modules			Recommended patchcord length and diameter
			1:8	1:16	1:32	
standard SC, E-2000™, FC	56	672	56	18[1]	–	2 m / Ø 2.0 - 2.4 mm
small-form-factor LX.5, LC	56	672	56	56	18[2]	2 m / Ø 1.7 - 2.0 mm

1) For split 1:16 one splitter module 1:2 and two concatenated splitter modules 1:8 are recommended
2) For split 1:32 one splitter module 1:2 and two concatenated splitter modules 1:16 are recommended

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

SUBUNITS – SIDEACCESS

Tray units	Height	Unit	Item no.
ODR-TU-1U-HOR-A1	1 U	1	84016894
ODR-TU-2U-HOR-A1	2 U	1	84016896
ODR-TU-3U-HOR-A1	3 U	1	84016901
ODR-TU-6U-HOR-A1	6 U	1	84016903

Features
- each U accommodates 2 fiber trays, 2 splitter modules up to 1:16 or 1 splitter modules 1:32
- integrated patchcord mandrels
- 19" rear mounted
- includes fixing parts

Conduits	Unit	Item no.
ODR-CONDUIT-VO-SLD-5M	5 m	84014504
ODR-CONDUIT-VO-SLD-100M	100 m	84014501

Feature
- bend radius limitation for loose tubes up to Ø 3 mm
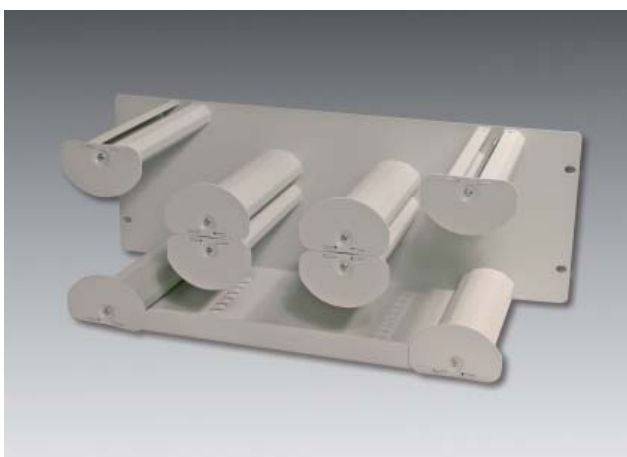
Cross-connect unit	Unit	Item no.
ODR-XU-4U-STA-A1	1	84018348

Features
- provides patchcord overlength take-up
- bend radius limitation 30mm
- 19" rear mounted
- includes fixing parts
- height 4 U

SUBUNITS – SIDEACCESS

Cable breakout plate	Unit	Item no.
INST-B/OUT-PLT-4U-A1	1	84014922

Features
- for fixing of cables jackets and central strength members
- cable fixing by means of cable ties or hose clamps
- conduit bracket for fixing loose tube conduits
- 19" and 21" (ETS) compatible
- height 4 U
- optional cover and spacer
- includes mounting material

Accessory for cable breakout plate	Unit	Item no.
cover for bottom cable entry INST-B/OUT-COVER-4U-BOT-E-A1	1	84021463

Accessory for cable breakout plate	Unit	Item no.
cover for top cable entry INST-B/OUT-COVER-4U-TOP-E-A1	1	84022231

Spacer	Unit	Item no.
INST-B/OUT-UPGRADE-4U-A1	2	84021461

Feature
- spacer (pair) for mounting a second cable mounting plate in front of the first

FIBER TRAYS – SIDEACCESS

- fast access to fibers and trays by telescopic runner
- up to 24 fibers per fiber tray (with SFF)
- bend radius control throughout
- side facing orientation of adaptors for high laser security
- fiber trays available in 7 colours
- separation of incoming fibers and pigtail fibers

Ordering code										Description
FTR										fiber tray - right handed
	B									blue - standard
	Y									yellow
	G									grey
	O									orange
	A									turqouise
	GN									green
	R									red
		H-								hinge fitted
			80-							code for adapter type, please see inside back cover
				nn-						number of fibers, max. 24
					09/					fiber type - singlemode 9/125 µm
					50/					fiber type - singlemode 50/125 µm
					62/					fiber type - singlemode 62.5/125 µm
						250				fiber construction - 250 µm
							A			heat shrink splice holder, splice protectors included
							B			sandwich splice holder, splice protectors not included
								1		standard variant
FTR	**B**	**H-**	**80-**	**12-**	**09/**	**250**	**A**	**1**		**ordering example**

Further fiber tray types, please see page 57 and following.

SPLITTER MODULES – SIDEACCESS

- fiber trays with integrated, high-quality splitters and pre-terminated fiber ends
- side facing orientation of adaptors for high laser security
- fast access to fibers and trays by telescopic runner
- splitter modules available in 7 colours
- access identification by sealing
- splitter configuration up to 1:32 per height unit

Ordering code										Description
FTR										fiber tray with splitters
	B									blue
	Y									yellow
	G									grey
	O									orange
	A									turquoise
	GN									green
	R									red
		H-								hinge fitted
			70/							input with connector: code for adapter type, please see inside back cover
				81-						output with connectors: code for adapter type, please see inside back cover
					01x					number of splitter per module
						1x32-				splitter configuration 1x2, 1x8, 1x16, 1x32
							EE			equal split
							90			unequal split 70:30, 80:20, 90:10
								01-		singlemode fiber 9/125 µm
									01	dual window 1310 nm and 1550 nm
FTR	**B**	**H-**	**70/**	**81-**	**01x**	**1x32-**	**EE**	**01-**	**01**	**ordering example**

SUBUNITS – FRONTACCESS
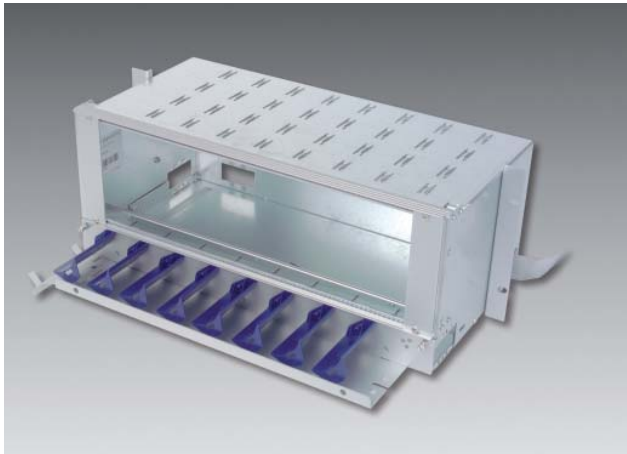
Description	Unit	Item no.
subrack 900F ODRF-SUBR-4U-8M/4S-A1	1	23040051
subrack 600F ODRF-SUBR-4U-6M/3S-A1	1	23040046

Features
- each subrack 900F can accommodate up to 8 splitter modules (1:2 up to 1:16) or compact modules
- each subrack 600F can accommodate up to 6 splitter modules (1:2 up to 1:16) or compact modules
- good access to inner space by pulling out or removing the integrated drawer
- includes bend radius limitation 45mm for incoming cables and 35mm for patchcords
- vertical rear fixing hole pitch standard 19"
- height 4 U
- includes fixing parts

Description	Unit	Item no.
loose tube guiding kit 900F ODRF-SUBR-SUPPL-8M/4S-A1	1	84003334
loose tube guiding kit 600F ODRF-SUBR-SUPPL-6M/3S-A1	1	84003530

Features
- to position and to limit bend radius of loose tubes within the subrack 600F/900F
- easy mounting within subracks
- clamping of loose tubes in the brackets

Cable mounting plate	Unit	Item no.
ODRF-CABLE-MOUNT-04-A1	1	84016555

Features
- for mounting of loose tubes, cables and subrack to a rail
- vertically rear fixing hole pitch 19" for subrack
- hammer head stampings for fixing cables with cable ties
- for one subrack
- height 4 U

SUBUNITS – FRONTACCESS
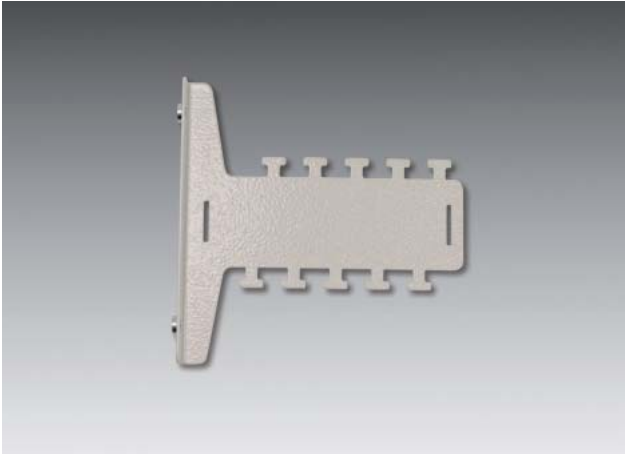
Cable bracket	Unit	Item no.
ODRF-CABLE-BRK-A1	1	84009058

Features
- vertically adjustable cable bracket for optimal cable fixing
- includes mounting screws
- suitable in conjunction with cable mounting plate
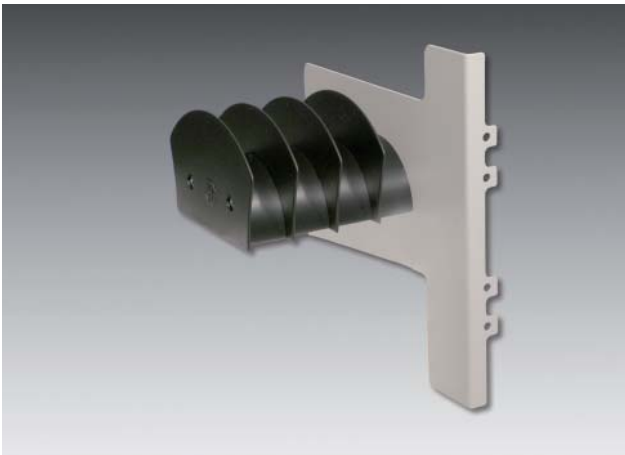
Patchcord management 800	Unit	Item no.
ODRF-PATCH-MGT-SUBR-A1	1	84016599

Features
- various positioning possibilities
- bend radius limitaion for patchcords 35 mm
- 4 mandrels in a stack for separation of different groups of pachtcords
- can be mounted at the front of the subrack
- for left and right hand use
- height 4 U

SUBUNITS – FRONTACCESS

Cable breakout plate	Unit	Item no.
INST-B/OUT-PLT-4U-A1	1	84014922

Features

- for fixing of cables jackets and central strength members
- cable fixing by means of cable ties or hose clamps
- conduit bracket for fixing loose tube conduits
- 19" and 21" (ETS) compatible
- height 4 U
- optional cover and spacer
- includes mounting material

Accessory for cable breakout plate	Unit	Item no.
cover for bottom cable entry INST-B/OUT-COVER-4U-BOT-E-A1	1	84021463

Accessory for cable breakout plate	Unit	Item no.
cover for top cable entry INST-B/OUT-COVER-4U-TOP-E-A1	1	84022231

Spacer	Unit	Item no.
INST-B/OUT-UPGRADE-4U-A1	2	84021461

Feature

- spacer (pair) for mounting a second cable mounting plate in front of the first

MCM COMPACT MODULES – FRONTACCESS

- front facing adaptors for fast access to connectors and patchcords
- top-mounted guiding rail for simple insertion and removal of modules
- separate storage room for loose tubes and pigtails
- bend radius control 35 mm

Ordering code									Description
MCM3-9U-									MCM compact module with 9 subunits
	LX5-								assembles with LX.5 pigtails
	FLC-								assembles with LC pigtails
	FLSH-								assembles with E-2000™ pigtails (compact adapters)
	FSC-								assembles with SC pigtails
	FSCD-								assembles with SC duplex adapters/ SC pigtails
	FST-								assembles with ST pigtails
	FCPC-								assembles with FCPC pigtails
	SPL-								for splicing only
		12-							number of pigtails
			A						singlemode APC 8° 9/125 µm
			B						singlemode PC 9/125 µm
				S					single-coloured pigtails – standard
				C					colour-coded pigtails
single-coloured pigtails/fibers					B-				high-end assembly class for singlemode only
SM 9µm yellow						SW0-			sandwich splice holder without splice protectors
MM 50µm orange						HS0-			heat shrink splice holder without splice protectors
MM 62µm blue							000		single-coloured pigtails/fibers - standard
capacity per subrack							001		fiber colour coding acc. to Swisscom, please see inside back cover
300F: max. 2 modules							002		fiber colour coding acc. to DIN VDE 888, please see inside back cover
600F: max. 6 modules							003		fiber colour coding acc. to ISO, please see inside back cover
900F: max. 8 modules									
MCM-9U-	**FSC-**	**12-**	**A**	**S**	**B-**	**SW0**	**000**		

SingleCircuit (SCM) compact modules see page 36

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

MCM SPLITTER MODULES – FRONTACCESS

- modules with integrated, high-quality splitters and pre-terminated fiber ends
- front facing orientation of adaptors for fast access to connectors and patchcords
- fast installation on site
- access identification by sealing
- splitter configuration up to 1:16 per module

Ordering code									Description
MCM3-									MCM module
	9U-								9 subunits
		73/							input with connector: code for adapter type, please see inside back cover
			89-						output with connectors: code for adapter type, please see inside back cover
				01x					number of splitters per splitter module
					1x16-				splitter configuration 1x2, 1x8, 1x16
						EE			equal split
						90			unequal split 70:30, 80:20, 90:10
							01-		singlemode fiber 9/125 μm
								01	dual window 1310 nm and 1550 nm
MCM3-	**9U-**	**73/**	**81-**	**01x**	**1x16-**	**EE**	**01-**	**01**	**ordering example**

BAY ACCESS UNIT

The bay access unit provides a secured transfer point to active components (as DSLAMS) in outdoor cabinets or for realisation of a network termination point in premises.

Features

- 6 SingleCircuit splice cassettes for connection of each 2 fibers, total 12 splices
- expandable up to 6 splices per splice cassette (MultiCircuit), total 36 splices
- with fast fixing mechanism for bays racks
- small width for use of the complete patchcord channel
- cover can be hooked in, possibility for sealing
- patch field for max. 12 adaptors
- strength relief of central strength member

- cable fixing by means of cable ties
- optional fixing of 3 conduits for loose tube protection or cables
- central earthing point
- fixing holes for wall mounting
- rape yellow powder coated steel housing (RAL 1021)
- dimensions 115 × 255 × 130 mm (W×H×D)

Ordering code						Description
BAU-						bay access unit
	SP/					splice through only
	PG/					holder for pigtail glands for ruggedised pigtail splicing (fixed connection)
	70/					code for adapter plate type (70=for SC/E-2000™)
		00-				for splicing only or fixed connection
		09-				singlemode 9um
			nn-			number of adapters/pigtail glands
				SW0-		sandwich splice protection holders (splice protectors not included)
				HS0-		head shrink splice protection holders (splice protectors not included)
					A1	standard variant

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

OVERVIEW SPLICE CLOSURES
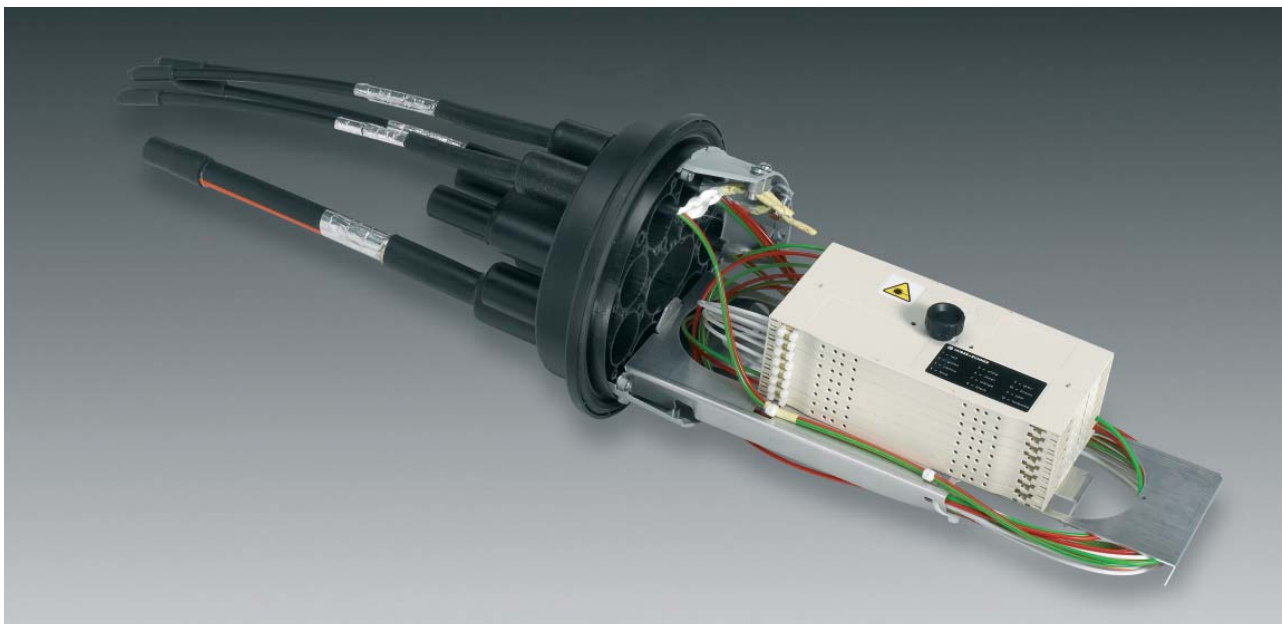
All USC dome closures can be opened and closed without the need for specific equipment, replacement seals or sealing materials. Access to the fiberoptic cassettes for fitting or servicing is achieved through the removal of the dome.

The large variety of cable entry openings, for uncut cables also, makes the USC closure family the perfect solution for all cable types used in the LAN and Telecom markets. An air vent for testing the integrity of the seals is integrated into the closure, as is a central strain relief element.

Features
- for MultiCiruit and SingleCircuit Management
- max. capacity of 96 splice connections for MultiCircuit, 96 for SingleCircuit
- bend radius limitations of 35 mm for fibers
- integrated fiber management without protective sleeves
- generous loose tube reserves
- for fitting to masts, walls, cable ducts or direct burial
- simple cable entry fittings using heat shrink or Cablelok
- fixings for cables central strength member
- closure openings for cut and uncut cables

Technical data	USC 500	USC 600	USC 750
length (mm)	500	600	750
diameter (mm)	150	205	205
weight approximately (kg)	3.1 kg	2.1 kg	2.3 kg
colour black (RAL 9005)	•	•	•
protection type (DIN 40050)	IP 67	IP 67	IP 67
material polypropylene	•	•	•
operating material	-30°C up to +60°C	-30°C up to +60°C	-30°C up to +60°C
installation temperature	-5°C up to +45°C	-5°C up to +45°C	-5°C up to +45°C
capacity of LISA MCM[1] splice cassettes and splice connections	4 48	8 96	– –
capacity of LISA SCM[2] splice cassettes and splice connections	6 12	30 60	48 96

[1] MCM - MultiCircuit Management [2] SCM - SingleCircuit Management

SPLICE CLOSURE USC 500
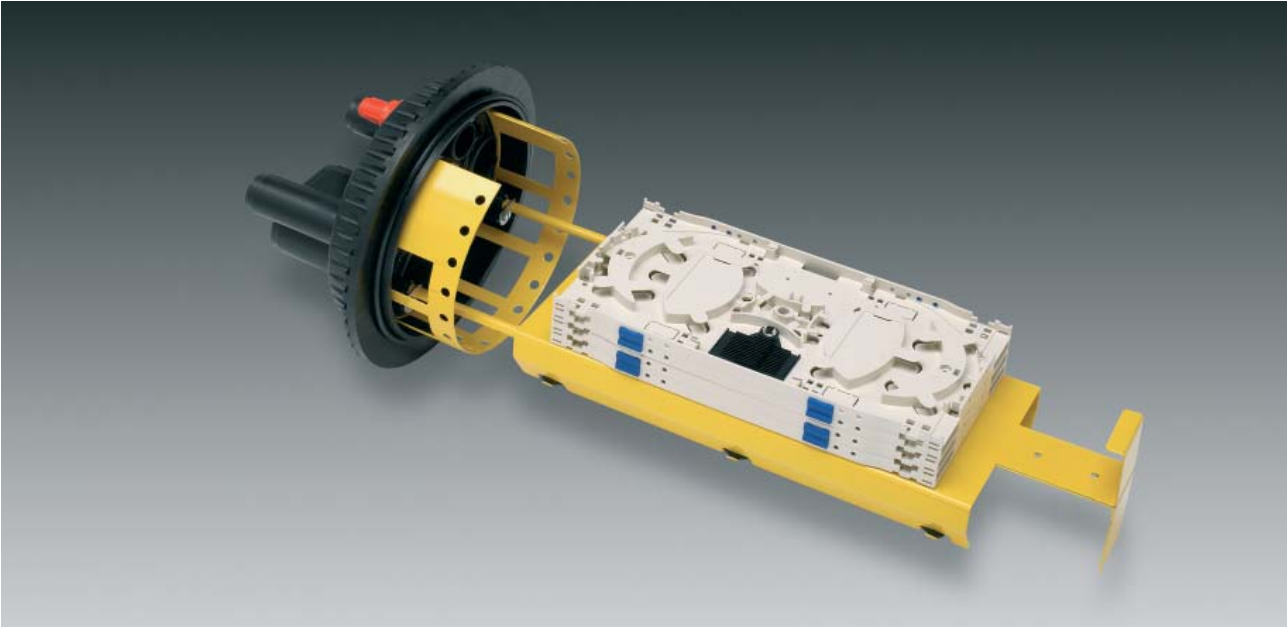
Equipped with an integrated fiber management for up to 48 splices, the USC 500 is ideal for trunk and local access networks where re-entry is required.

The closure is supplied with 2 circular ports, an oval port for loop through applications and splice cassettes, which can accomodate different types of splice holders and a storage basket for loop through fiber buffer tubes.

An O-ring and a moulded plastic clamp provide the seal between the cover and the base, in addition adhesive heat shrink sleeves are used to seal cables to the base.

Features
- low installation costs
- durable
- UV stabilised
- rugged and compact design
- no compounds needed for sealing
- closing ring with hole for padlock
- for aerial and underground applications
- direct fastening to poles or walls with optional wall fixing
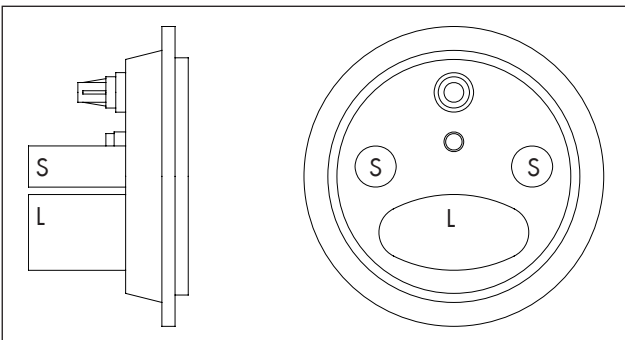
Cable entry	Unit	Inner Ø (mm)	Length (mm)	Suitable cable Ø (mm)
L	1	66 × 36	60	2 × (6-30)
S	2	21	60	6-19

For splice components (e.g. splice protectors) please see chapter «Splice cassettes and accessories»

SPLICE CLOSURE USC 500

Description USC 500	Ordering example
incl. 4 MCM splice cassettes, 1 lid, with 4 splice holders for sandwich splice protection	USC500-MCM-48-SW0-U
incl. 4 MCM splice cassettes, 1 lid, with 8 splice holders for heat shrink splice protection holders	USC500-MCM-48-HS0-U

Description USC 500	Ordering example
incl. 6 SCM splice cassettes, 6 splice holders for sandwich splice protection	USC500-SCM-12-SW0-U
incl. 6 SCM splice cassettes, 6 splice holders for heat shrink splice protection	USC500-SCM-12-HS0-U

Cassette system	Variant	Number of splices per cassette	Number of cassettes	Number of splices	Ordering code (see below)
MCM	standard	12	max. 4	max. 48	USC500-MCM-...
SCM	standard	2	6	12	USC500-SCM-12-...
SCM	expansion*	6	6	36	USC500-SCM-36-HS0... for heat shrink splice protection
SCM	expansion*	8	6	48	USC500-SCM-48-SW0... for sandwich splice protection

* an additional set of splice holders is necessary
  heat shrink splice holder (Item no. 84004064), sandwich splice holder (Item no. 84004065)

Ordering code				Description
USC500-				universal splice closure 500
	MCM-			MultiCircuit management
	SCM-			SingleCircuit management
		48-		number of splice connections: 12, 24, 36 or 48
			SW0-	splice holders for sandwich splice protectors
			HS0-	splice holders for heat shrink splice protectors
			U	unmounted
			A	assembled

SPLICE CLOSURE USC 500
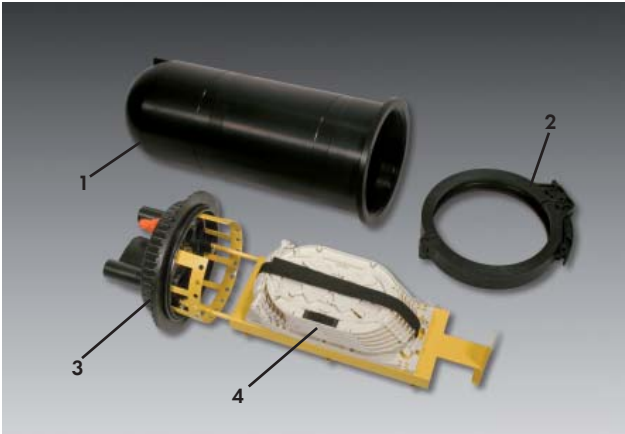
Scope of supply USC 500:

1 1 closure body

2 1 closing ring

3 1 closure entry with base plate

4 1 to 4 MCM splice cassettes with hinges, 1 to 4 sandwich or 2 to 8 heat shrink splice holders
or
6 SCM splice cassettes with fiber management and distribution cassette, 6 sandwich or heat shrink splice holders

5 2 abrasive papers for cable preparation

6 1 heat shrink tube for oval port, including bracket

7 2 head shrink tubes for outer ports

8 1 desiccant bag

9 16 cable ties

10 1 foil for port protection

11 4 fixing parts for cable strength members

12 4 cleaning cloths

13 3 foils for cable protection

mounting screws for splice cassettes

assembly instruction

Accessory
- for mounting on wall or mast
- two piece construction and fixed with wing nut
- hot-dip galvanised steel, stainless hose clamps

Closure fitting	Unit	Item no.
USC-ACC-MOUNT-A1	1	84015940

SPLICE CLOSURE USC 600

Description USC 600	Ordering examples
incl. 8 MCM splice cassettes with 8 splice holders (12 way) for sandwich splice protection	USC600-MCM-96-SW-U
incl. 8 MCM splice cassettes with 16 splice holders (6 way) for heat shrink splice protection	USC600-MCM-96-HS-U

Cable sealing parts have to be ordered separately

Description USC 600	Ordering examples
incl. 30 SCM splice cassettes with 30 splice holders (6 way) for sandwich splice protection	USC600-SCM-60-SW-U
incl. 30 SCM splice cassettes with 30 splice holders (3 way) for heat shrink splice protection	USC600-SCM-60-HS-U

Cable sealing parts have to be ordered separately

Ordering code					Description
USC600-					universal splice closure 600 mm
	MCM-				MultiCircuit management, max. 96 splice connections
	SCM-				SingleCircuit management, max. 60 splice connections
		nn-			number of splice connections 12, 24, 36 etc., in steps of 12
			SW0-		sandwich splice protection holder
			HS0-		heat shrink splice protection holder
				U	single parts, unassembled
				A	assembled
USC600-	MCM-	96-	SW0-	A	example

Cable sealing parts have to be ordered separately

SPLICE CLOSURE USC 750

Description USC 750	Ordering example
incl. 48 SCM splice cassettes with 48 splice holder (6 way) for sandwich splice protection	USC750-SCM-96-SW-U
incl. 48 SCM splice cassettes with 48 splice holders (3 way) for heat shrink splice protection	USC750-SCM-96-HS-U

Cable sealing parts have to be ordered separately

Ordering code					Description
USC750-					universal splice closure 750 mm
	SCM-				SingleCircuit management, max. 96 splice connections
		nn-			number of splice connections 12, 24, 36 etc., in steps of 12
			SW0-		sandwich splice protection holder
			HS0-		heat shrink splice protection holder
				U	single parts, unassembled
				A	assembled
USC750-	SCM-	96-	SW0-	A	example

Cable sealing parts have to be ordered separately

SPLICE CLOSURE

Scope of supply USC 600, USC 750

1 closure body

2 closure entry

3 closing ring

4 universal mounting plate for SCM or MCM cassettes

5 fixing material for splice cassettes

6 cassettes and accessories as ordered

7 abrasive paper for cable preparation

8 desiccant bags

9 2 heat protection plates

10 cleaning cloths

11 cable ties

12 2 fastening plates for strain relief for outer ports

13 fastening plate for strain relief for middle port

14 8 fixing parts for cable strength members

15 heat protection foil for cables

  assembly instruction

For splice components (e.g. splice protectors) please see chapter «Splice cassettes and accessories »

SPLICE CLOSURE ACCESSORIES
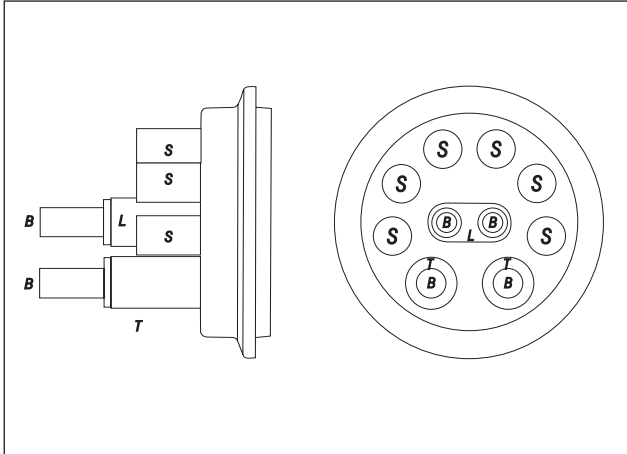
Cable entry	Qty.	Inner-Ø (mm)	Length (mm)	Suitable cable Ø (mm)
L	1	66 × 36	73	2 × (8-24)
T	2	37	73	8-36
S	6	26.5	55	12-26
B	4	19	55	6-18

kit L

USC heat shrink kits
- for proper sealing of cables on the ports of USC 600 and USC 750

Description	Cable Ø [mm]	Unit	Item no.
kit L USC-ACC-H/SHRINK-L	2× 8-24	1	23039742

Kit L includes
- 1 heat shrink tube
- 1 abrasive paper
- 2 cleaning cloths
- 1 aluminium foil
- 1 clamp

kit B/S and T

Description	Cable Ø [mm]	Unit	Item no.
kit B/S USC-ACC-H/SHRINK-BS	6-26	2	23039743
kit T USC-ACC-H/SHRINK-T	8-36	2	23039744

Kit B/S and T include
- 2 heat shrink tubes
- 1 abrasive paper
- 2 cleaning cloths
- 1 aluminium foil
- 1 heat protection plate

SPLICE CLOSURE ACCESSORIES

kit L

USC Cablelok
- aligned kits for a big range of cable diameter for mechanical sealing of the ports of USC 600 and USC 750.

Description	Cable Ø [mm]	Unit	Item no.
kit L1 USC-ACC-LOK-L1	2 × 12.5-15	1	84003062
kit L2 USC-ACC-LOK-L2	2 × 15-18	1	84003064
kit L3 USC-ACC-LOK-L3	2 × 20-21.5	1	84003066

kit B/S and T

Description	Cable Ø [mm]	Unit	Item no.
kit B1 USC-ACC-LOK-B1	8-14	2	84003050
kit B2 USC-ACC-LOK-B2	13-16.5	2	84003052
kit S1 USC-ACC-LOK-S1	8-12	2	84003068
kit S2 USC-ACC-LOK-S2	12-16	2	84003070
kit S3 USC-ACC-LOK-S3	16-20	2	84003072
kit T1 USC-ACC-LOK-T1	20.5-23.5	2	84003074
kit T2 USC-ACC-LOK-T2	23.5-25.5	2	84003076
kit T3 USC-ACC-LOK-T3	24.5-29	2	84003078
kit T5 USC-ACC-LOK-T5	15.5-22	2	84003081

SPLICE CLOSURE ACCESSORIES

USC port opening tool
- to open ports of USC 600 and USC 750 special tools are recommended. They are mandatory for Cablelok.

Description	Unit	Item no.
tool B USC-ACC-TOOL-B	1	84003083
tool S USC-ACC-TOOL-S	1	84003085

Earthing kit
- for USC 600 and USC 750, includes earthing bolt, O-ring, 4 nuts, 4 washers and 2 spring washers

Earthing kit	Unit	Item no.
USC-ACC-EARTH-A1	1	84004165

Closure fitting
- for mounting at wall or mast
- tapered mounting holes to hook in pre-installed screws
- mounting at closure body
- two hose clamps included
- stainless steel
- suitable for USC 600 and USC 750 or similar types up to Ø 200 mm

Closure fitting	Unit	Item no.
USC-ACC-DOME-MOUNT-A1	1	84016959

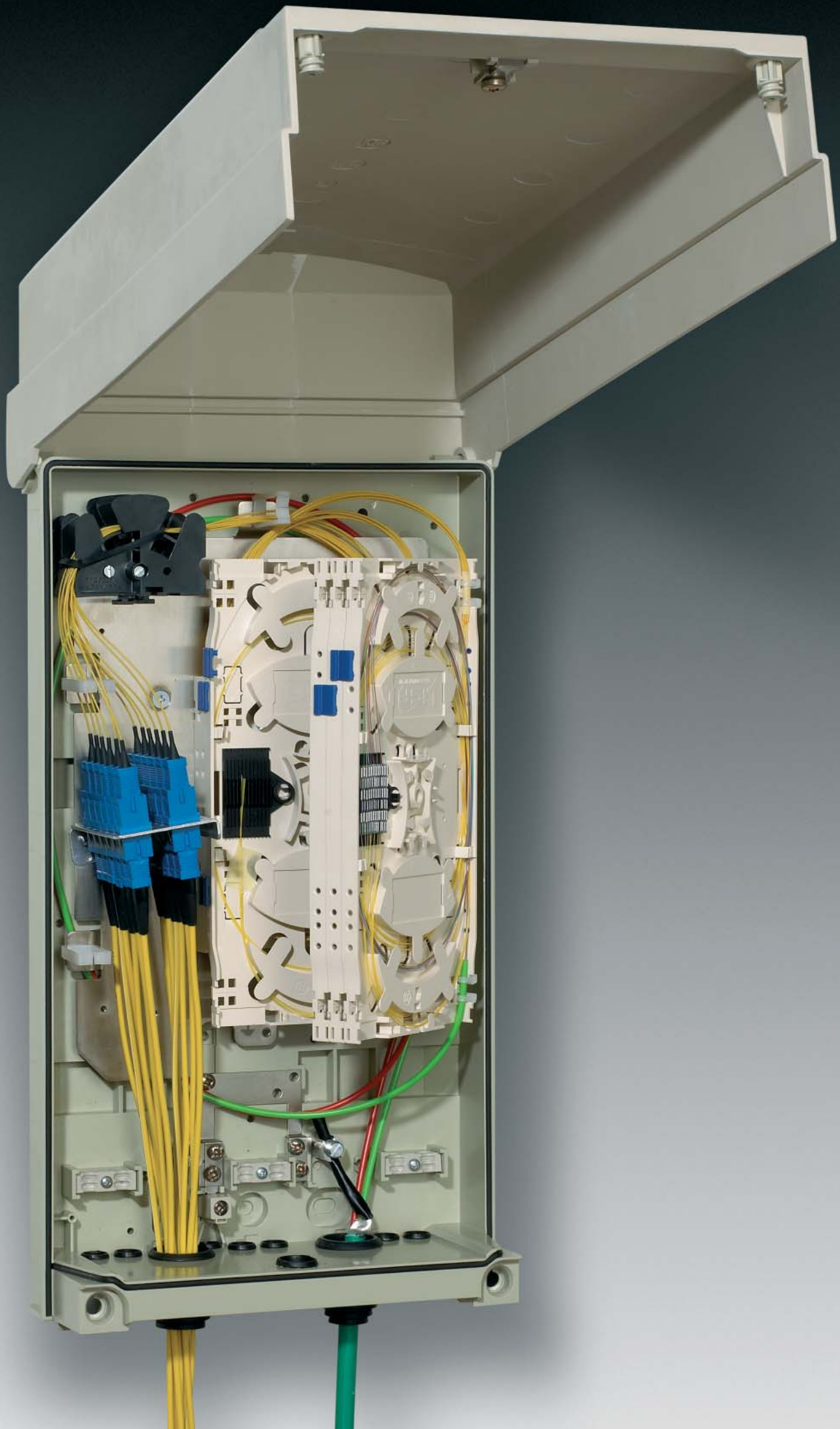# SPLICE CLOSURE ACCESSORIES

Wall/mast fitting

- for fastening USC 600 and USC 750 to a wall or mast
- closure entry with splice cassettes can be hold in the same position after removing the closure body
- bolts and securing split pins are included

Wall/mast fitting	Unit	Item no.
USC-ACC-MOUNT-A1	1	23039741

WAN – NETWORK TERMINATION

WAN - Network termination

WALL BOX OUTDOOR WBOC

A compact wall-outlet providing an optical demarcation point for Fiber-to-the-X applications. Mounted on the inside or outside of a building, the optical NID (network interface device) provides physical protection for the transition between provider and customer.

General Features

- very compact design
- up to 4 adaptors can be loaded
- housing with hinged cover
- cover with snap mechanism and hole for lock
- light and robust construction
- various cable entry possibilities
- fixing of central strength member possible
- protection class IP 54 (optional IP 64 with sealing)
- wall mounting knockouts for easy fixation
- can be mounted on wall or pole

- no additional pole mounting kit required
- thermoplastic, cover glass fiber reinforced
- black housing, grey cover
- dimensions 137 × 173 × 83 mm (W×H×D)

3 different configurations can be achieved:
- splice through
- splice/patch
- patch through

Cable entry

Cable entry positions at the base of the box:

- 2 ports for cables up to Ø 15mm
- 3 ports for cables up to Ø 13mm
- 1 ports for cables up to Ø 9mm
- 6 ports for cables up to Ø 5mm

Cable entry grommets are made of polyethylene

WALL BOX OUTDOOR WBOC

Ordering code							Description
WBOC-							wall box outdoor compact WBOC
	00/						adapter code for SC and LC, see inside back cover
		00-					splice through
		09-					singlemode 9µm
		50-					multimode 50µm
		62-					multimode 62.5µm
			nn/				number of adapters (00 without). Max. 4 for SC, max. 3 duplex for LC
				nn-			number of pigtails (00 ohne)
					SW0-		sandwich splice holder (for max. 12 splices)
					HS0-		heat shrink splice holder (for max. 6 splices)
						A1	standard variant

Examples

WBOC-	70/	09-	04/	04-	HS0-	A1	WBOC with 4 x SC/PC SM adapters and pigtails
WBOC-	70/	00-	00/	00-	HS0-	A1	WBOC with heat shrink splice holder for splice through
WBOC-	70/	50-	04/	00-	HS0-	A1	WBOC with 4 x SC MM adapters for patch through

Note: The WBOC is supplied with an integrated adapter plate as standard. The adapter plate will be supplied to suit an SC footprint as standard unless otherwise stated.

Scope of supply

1 housing and hinged cover
1 base plate with integrated adaptor plate with 4 x SC footprint
2 self-adhesive cable management clips
optional splice holder depending on ordering code
optional adaptors depending on ordering code
optional pigtails depending on ordering code

![LiSA HUBER+SUHNER logo]

WALL BOX OUTDOOR WBO

General Features
- many different configuration variants of fiber connection
- splice variants with MultiCircuit Management (MCM) or SingleCircuit Management (SCM)
- every splice cassette individually accessible for easy fiber access
- bend radius limitation of 35 mm for fibers and 30mm for pigtails and patchcords
- protection class IP54/IP64
- hinged and glass fiber reinforced cover with lock system (optional lock)
- for indoor and outdoor applications

- wall mounting with screws and mast fitting with metal belts (material not included)
- thermoplastic housing
- colour pebble grey (RAL 7032)
- dimensions 223 × 391× 124 mm (W×H×D)

4 different basic configurations can be achieved:
- splice through
- splice/patch
- splice/patch/splice
- patch through

WALL BOX OUTDOOR WBO

Splice through variants

- max. 48 splices with MCM

- max. 24 splices with SCM

Splice/patch variants

- max. 48 splices with MCM
- max. 12 patch connections with MCM

- max. 24 splices with SCM
- max. 12 patch connections with SCM

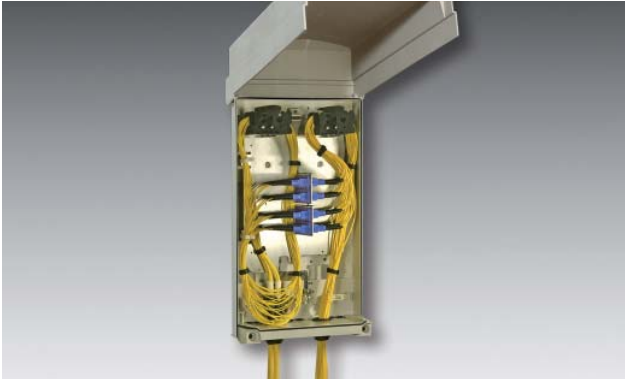## Splice/patch/splice variants

- max. 48 splices with MCM
- max. 12 patch connections with MCM

- max. 24 splices with SCM
- max. 12 patch connections with SCM

WALL BOX OUTDOOR WBO

Patch through variant

• max. 24 patch connections

Ordering code								Description
WBO–								wall box outdoor WBO
	APL–							adapter plate fitted, for patch through only
	MCM–							MultiCircuit-Management
	SCM–							SingleCircuit-Management
		00–						for patch through only
		12–						number of splice cassettes: max. 4 MCM, 12 SCM
			00/					code for adapter type, please see inside back cover
				09–				singlemode 9 µm
				50–				multimode 50 µm
				62–				multimode 62.5 µm
					nn/			number of adapters max. 12 for splice/patch max. 24 for patch through
						nn–		number of pigtails: max. 12 for splice/patch variant max. 24 for splice/patch/splice variant
							SW0–	sandwich splice protection holder (splice protectors not included)
							HS0–	heat shrink splice protection holder (splice protectors not included)
							A10	standard variant

Note: Pigtails are supplied with the box (not installed).
    MASTERLINE and patchcords have to be ordered separately, see chapter «Connectivity».

ACCESSORIES WBO

Central strength member clamp	Unit	Item no.
CSM-CLAMP-A1	10	84010409

Lock for cover	Unit	Item no.
with 2 keys	1	on request
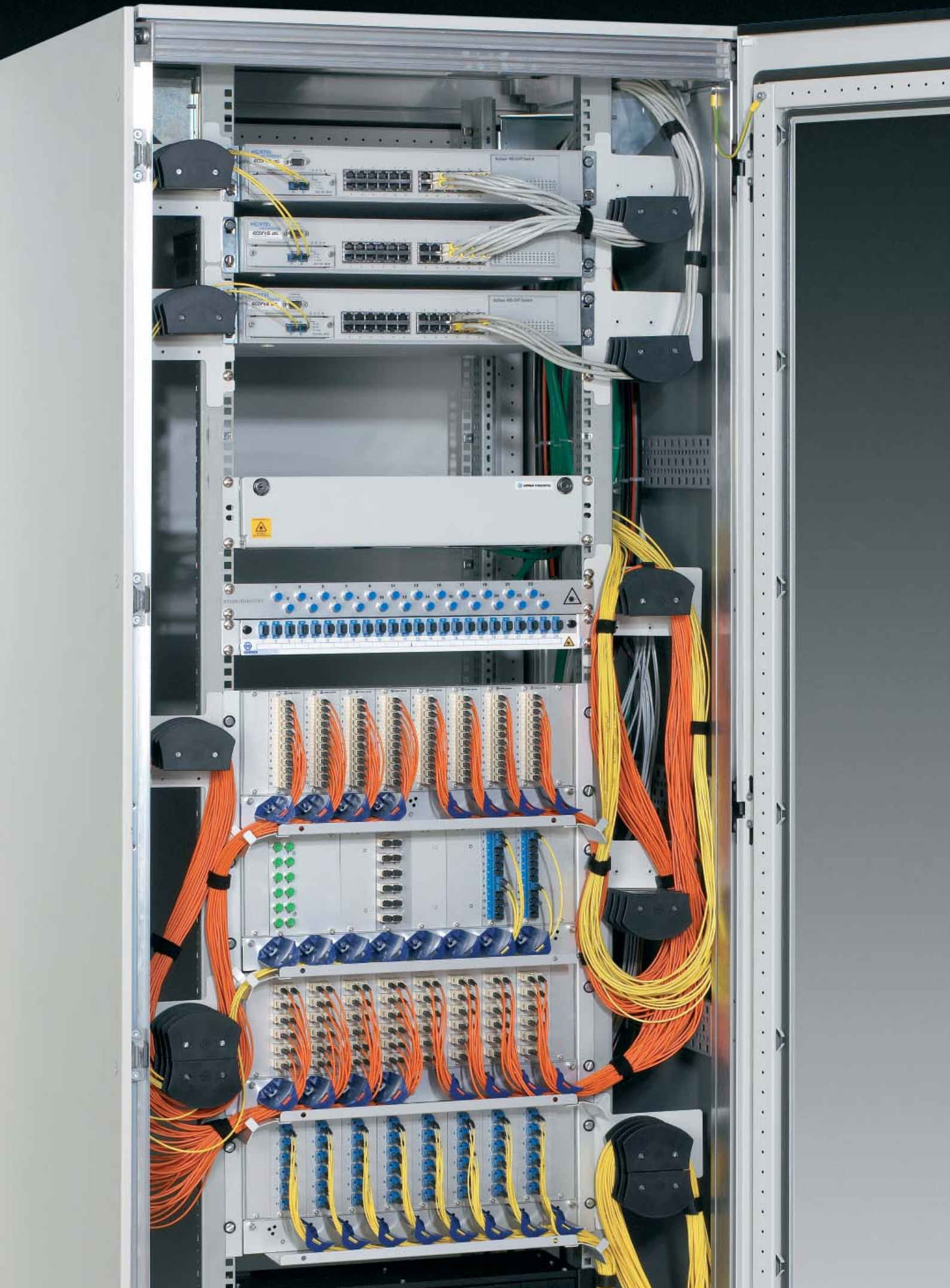
WAN - Network termination

LAN – BUILDING AND BACKBONE CABLING

LAN - Building and backbone cabling
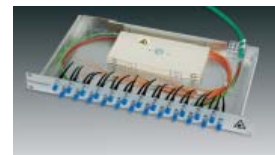
CONFIGURATION EXAMPLES ODR 800F (19")

active/passive
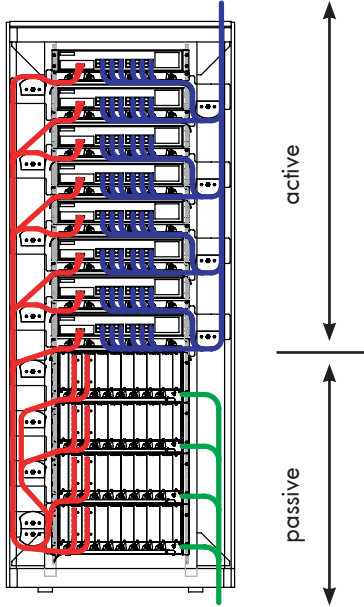
- bottom cable entry and patching fibers from lower subracks to upper switches
- exiting cables to the top
- alternatively top cable entry and bottom cable exit
- patchcord guiding beneath each active device with patch-cord channel 19"
- side mounted patchcord overlength storage
- recommended patchcord length[1] for internal patching: 3.0 m

system-to-line
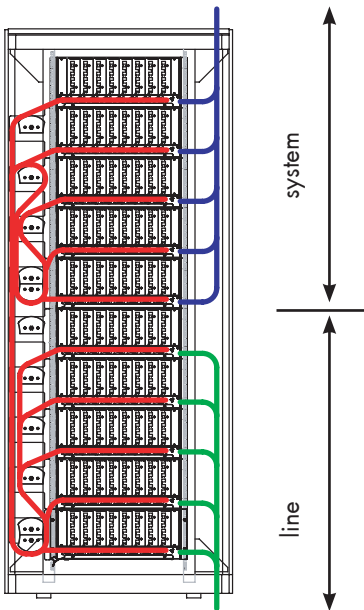
- bottom cable entry/exit and patching fibers from system to line side
- side mounted patchcord overlength storage
- alternatively patchcord management on both sides
- recommended patchcord length[1] for internal patching: 3.0 m

———— internal patchcord connection (cross-connection)

———— external patchcord/cable connection (interconnection)

———— incoming/outgoing cables (line)

HUBER+SUHNER specialists offer planning of the rack configuration, cable routing and rack interconnection based on customer requirements. For more information please see chapter «Introduction» pages Services.

1) Order code for patchcords please see chapter «Connectivity», recommended patchcord Ø 2.0 up to 2.4 mm

ODR 800F (19") RACK
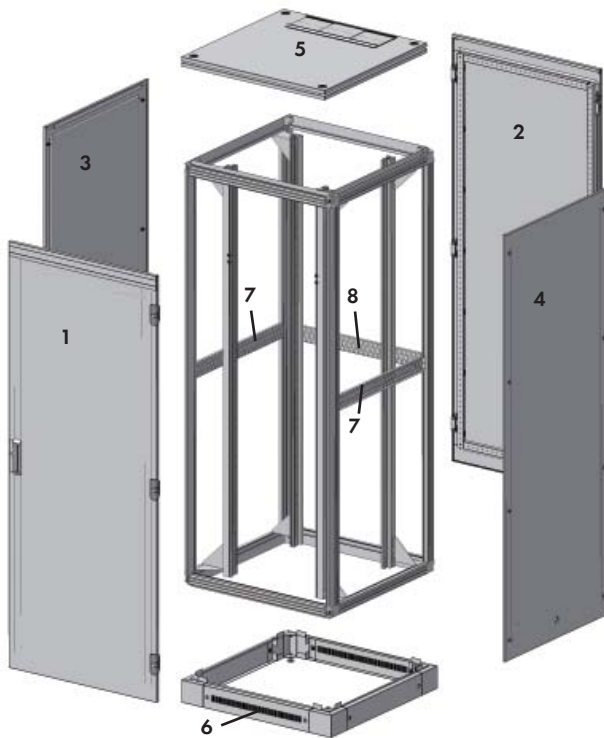
Features

- front patchcord management with height of 4U
- max. 11 subracks 900F or other units up to 44U
- easy installation and handling of compact modules by one person
- fast and easy installation or removal of side walls and doors
- for front and rearside mounting of components for flexible rack equipment (e.g. standard CTB, active devices)

Characteristics

- base rack with front-mounted rails (19") includes 30 cage nuts M6 to mount components to the rails
- leveling with height adjustable feet
- front side glass door and back side steel door each with locking handle and 2 keys
- optional base and earthing kits
- optional assembly rail to fix cables (T800 for depth and B800 for width)
- robust steel metal construction
- light grey powder coated (RAL 7035)
- dimensions (W×D×H) 800 × 800 × 2000 mm

	1	2	3	4	5	Part in drawing
ODR800F-						rack 800F (19")
	F0					without front door
	F1					with front door
		B0/				without back wall
		B1/				with back wall
			0			without left side wall
			1			with left side wall
				0-		without right side wall
				1-		with right side wall
				C0-		without patchcord routing channel
					X-	without power socket
					A	without top cover
					D	with top cover
					1	standard variant

Optional components (Pos. 6 – 8) see next page

ODR 800F (19") ACCESSORIES

Optional

	Description	Unit	Item no.
6	base 800 ODRF-ACC-800-BASE-A1	1	23040061
7	assembly rail T800 ODRF-ACC-800-RAIL-D-A1	1	23040064
8	assembly rail B800 ODRF-ACC-800-RAIL-W-A1	1	23040063

Positions see previous page.
Building blocks please see next pages.
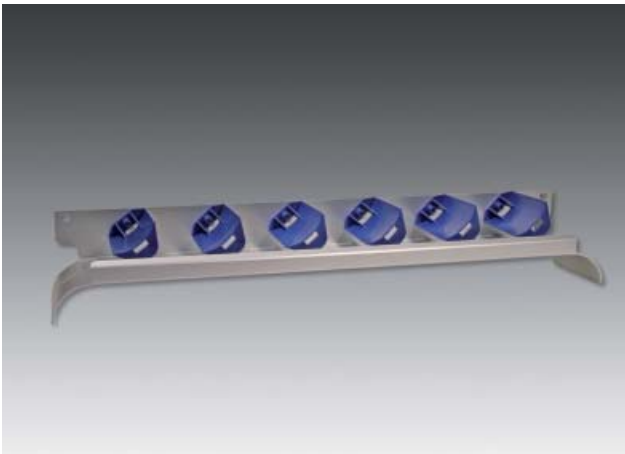
Patchcord channel 19"	Unit	Item no.
KPM3-RANG-003	1	84012555

Features

- easy patchcord organisation
- mounting beneath CTB, active device or similar
- bend radius limitation of 35 mm
- adjustable bend radius limiters
- compact aluminum design
- height: 1U
- for ODR 800F (19")

HUBER+SUHNER FIBER OPTICS

SUBRACKS AND PATCHCORD MANAGEMENT

Subrack 900F	Unit.	Item no.
ODRF-SUBR-4U-8M/4S-A1	1	23040051

Features
- accomodates up to 8 MCM, 4 SCM compact modules or a combination of both
- bend radius limitation for incoming cables 45 mm and for patchcords 35 mm
- good access to the inner space by pulling out or removing the integrated drawer
- includes mounting parts
- height 4U
- suitable for ODR 800F (19") and ODR 900F

Compact modules please see next page

Loose tube guiding kit 900F	Unit	Item no.
ODRF-SUBR-SUPPL-8M/4S-A1	1	84003334

Description
- to position and to limit bend radius of loose tubes within the subrack 900F
- snap-in mounting of the crossbar
- clamping of the loose tubes in the brackets
- suitable for ODR 800F (19") and ODR 900F

Patchcord management 800	Unit	Item no.
ODRF-PATCH-MGT-800-A1	1	23040070

Features
- various positioning possibilities
- bend radius limitation for patchcords 35 mm
- 4 mandrels in a stack for separation of different groups of patch cables
- can be retrofitted under the front mounting angle of subrack or boxes by loosening the screws
- for left and right hand side use
- height 4U

LAN - Building and backbone cabling

MCM COMPACT MODULES

**example module
for splicing only**

Ordering code							Description	
MCM3-9U-							MCM compact module with 9 subunits	
	LX5-						assembled with LX.5 pigtails	
	FLC-						assembled with LC pigtails	
	FLSH-						assembled with E-2000™ pigtails (compact adapters)	
	FSC-						assembled with SC pigtails	
	FSCD-						assembled with SC duplex flangeless adapters/SC pigtails	
	FST-						assembled with ST pigtails	
	FCPC-						assembled with FCPC pigtails	
	SPL-						for splicing only	
		12-					number of pigtails	
			A				singlemode APC 8°	9 µm
			B				singlemode PC	9 µm
			C				multimode	50 µm
			D				multimode	62.5 µm
				S			single-coloured pigtails – standard	
				C			colour coded pigtails	
					B-		High-End assembly class	for singlemode only
					M-		multimode	
						SW0-	splice holder for sandwich splice protectors (excl. splice protectors)	
						HS0-	splice holder for heat shrink splice protectors (excl. splice protectors)	
						000	single-coloured pigtails/fibers - standard	
						001	fiber colour code acc. to Swisscom, see inside back cover	
						002	fiber colour code acc. to DIN VDE 0888, see inside back cover	
						003	fiber colour code acc. to ISO, see inside back cover	

Single-coloured pigtails/fibers
SM 9 µm   yellow
MM 50 µm   orange
MM 62 µm   blue

Capacity per subrack
300F: max. 2 modules
600F: max. 6 modules
900F: max. 8 modules

Information on SCM compact modules see chapter «WAN - Central office» on page 36

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

ODU – OPTIMISED DISTRIBUTION UNITS

The ODU is a 19" subrack that can be front mounted to any standard rack. All of the LISA fiber tray range can be housed in the ODU including pre-terminated M3K assemblies. Flexible mounting points at the rear of the ODU make cable glanding quick and easy, whilst bend-limiting conduit gives ultimate protection to the incoming fibers. Patchcord protection is achieved by the ODU's moulded exit guide and lockable steel doors offer complete access security.

Features
- 19" Front mounting
- available as 1 U, 2 U, 3 U and 6 U
- each U accommodates 2 Fiber Trays
- splicing and M3K versions
- lockable and removable front door
- vented for Ai r-Flow
- steel construction
- powder coated light grey (RAL 7035)
- fixing and installation kit included

Ordering information: Optimised Distribution Units

Description	Unit	Item no.
ODU 1 U for splicing 2 x fiber trays	1	84004222
ODU 2 U for splicing 4 x fiber trays	1	84004224
ODU 3 U for splicing 6 x fiber trays	1	84004226
ODU 6 U for splicing 12 x fiber trays	1	84004229

Ordering information: Optimised Distribution Units M3K

Description	Unit	Item no.
ODU 1 U unit for 2 x fiber trays (M3K)	1	84004232
ODU 2 U unit for 4 x fiber trays (M3K)	1	84004234
ODU 3 U unit for 6 x fiber trays (M3K)	1	84004236
ODU 6 U unit for 12 x fiber trays (M3K)	1	84004238

Application examples please see pages 128 and 136

Fiber trays please see next page

FIBER TRAYS FOR PIGTAIL SPLICING

Ordering code								Description
FTR								fiber tray – right handed
	B							blue – standard
	Y							yellow
	G							frey
	O							orange
	A							turquoise
	GN							green
	R							red
		H–						hinge fitted[1]
			80–					code for adapter type, please see inside back cover
				nn-				number of fibers, max. 24
					09/			fiber type - singlemode 9/125 µm
					50/			fiber type - multimode 50/125 µm[2]
					62/			fiber type - multimode 62.5/125 µm
						250		fiber construction - 250 µm
							A	heat shrink splice holder, splice protectors included
							B	sandwich splice holder (splice protectors not included)
							1	standard variant

1) Hinge not used for wall boxes; omit the «H» in the ordering code

2) OM3 fiber on request

HUBER+SUHNER FIBER OPTICS

SPLICE THROUGH FIBER TRAYS

2 x 12 fiber loose tubes from different cables can be fixed to the Fiber Tray so as to provide an effective loop-back connection. Each 12 fiber bundle is routed in different areas of the FT making coiling and identification simple. For this application no adapter plate is required.

2 loose tubes are glanded at the side of the ODR-TU to allow loose tube-loose tube splicing.

Ordering code							Description
FTR							fiber tray – right handed
	B						blue – standard
	Y						yellow
	G						grey
	O						orange
	A						turquoise
	GN						green
	R						red
		H-					hinge fitted[1]
			NX-				no adapter plate
				12-			number of splices
					250		fiber construction - 250 µm
						A	heat shrink splice holder, splice protectors included
						B	sandwich splice holder (splice protectors not included)
						1	standard variant

1) Hinge not used for wall boxes; omit the «H» in the ordering code

Splice cassettes

LAN - Building and backbone cabling

CTB 19" WITH SPLITTERS

- CTB's with integrated, top-quality splitters and terminated fiber ends
- space-saving 19" rack installation
- frontal adaptor position for fast access to connectors and patchcables
- access identification through sealing
- split ratio up to 1:32 per CTB

Ordering code									Description
KSD1-									standard CTB 19", 1 U
KSD2-									standard CTB 19", 2 U
KFB1-									FiberFrame CTB 19", 1 U
KFB2-									FiberFrame CTB 19", 2 U
	70/								input with connector: code for adaptor type, please see inside back cover
		70-							output with connector: code for adaptor type, please see inside back cover
			01x						number of splitter per CTB
				1x32-					splitter configuration 1x2, 1x8, 1x16, 1x32
					EE				equal split
					90				unequal split 70:30, 80:20, 90:10
						01-			singlemode fiber 9/125 µm
							01-		dual window 1310nm and 1550 nm for singlemode
								A	perforated plate for cable fixing with cable ties (left/right)
								K	dust protection cover (left/right)
									optional fixing set
KSD1-	70/	70	08x	1x2-	90	01-	01-	KK	ordering example

ORDERING CODE FOR POPULATED CTB'S

Ordering code	Description
	housing variant
KSD1 –	CTB 19" 1 U standard, max. 24 fibers
KSD2 –	CTB 19" 2 U standard, max. 48 fibers
KFB1 –	CTB 19" 1 U FiberFrame, max. 24 fibers
KFB2 –	CTB 19" 2 U FiberFrame, max. 48 fibers
	front panel variant
A –	20-way
B –	24-way
C –	24-way, zigzag alignment
D –	48-way
E –	48-way, zigzag alignment
20 –	**connector code** please see inside back cover
6 –	**number of loose tubes** 1 – 6
48 –	**number of fibers** 1 – 48
	fiber type
09 –	9 µm
50 –	50 µm
62 –	62.5 µm
1 –	**splice cassette** LISA MCM
	cover for splice cassette
0 –	without cover
1 –	with cover
	splice-protection and holder
1 –	sandwich, 12-way recommented type
2 –	shrinked, 60 mm, 6-way
3 –	shrinked, 45 mm, 6-way recommented type
4 –	shrinked, 23 mm, 10-way
	cable entry
A	perforated plate
B	MASTERLINE classic 2 - 12 fibers
C	MASTERLINE classic 14 - 24 fibers
D	MASTERLINE classic 26 - 48 fibers
E	with cable gland 90° PG 11-5-12
F	with cable gland 90° PG 16-8-15
G	with cable gland 90° PG 21-11-20.5
H	with cable gland 45° PG 7/11-3-10
I	with cable gland 45° PG 11/16-5-14
K	dust protection cover
	optional fixing set
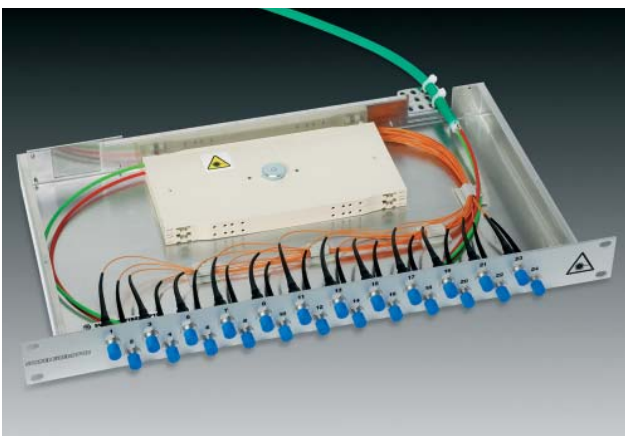
Please see next page for available types and detailed information

Populated CTB

LAN - Building and backbone cabling

CTB 19" 1 U/2 U; STANDARD – UNPOPULATED


application example
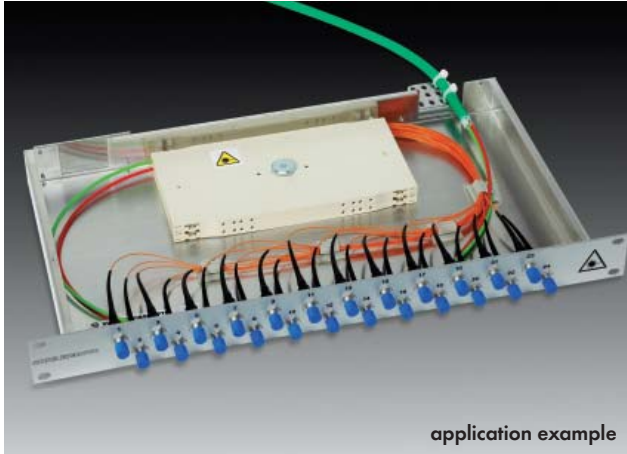
Features
- space-saving 19" rack installation
- 2 to 48 adapter holes
- spare multi-fiber loose tube and pigtail tube in housing
- interface for MCM splice cassette with bend radius 35 mm throughout. For standard splice holder etc. please see chapter «Splice cassettes and accessories»

Material
- standard aluminium
- front plate: anodized aluminium

Scope of supply
- housing including cover
- front plate
- cable entry with perforated plate
- mounting instruction

Dimensions in mm:

482.6 (19") · 43.8 · 1 U

Zigzag alignment:

482.6 (19") · 43.8 · 1 U · 87.7 · 2 U

424 · 235
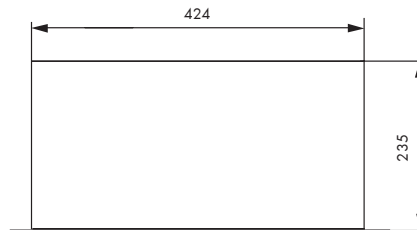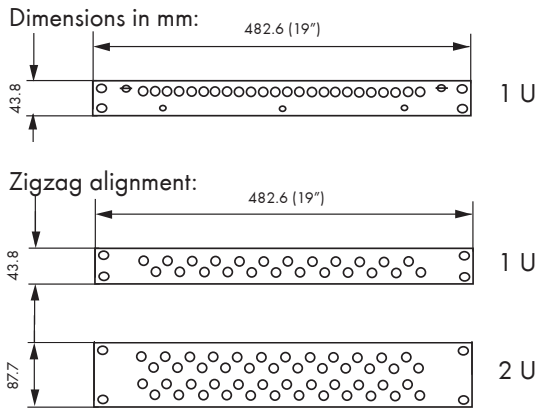
Unpopulated CTB's

Description	Height (U)	Item no.
for max. 20 ST adapters	1	22653006
for max. 20 FCPC adapters	1	22653004
for max. 20 SC adapters	1	22653012
for max. 12 LC adapters	1	23025982
for max. 12 LX.5 adapters	1	23027717
for max. 12 MT-RJ adapters	1	23027716
zigzag alignment		
for max. 24 ST adapters	1	22653010
for max. 24 FCPC adapters	1	22653011
for max. 24 SC adapters	1	22653008
for max. 12 SC duplex adapters	1	23037075
for max. 24 E-2000™ adapters	1	23017093
for max. 48 ST adapters	2	22653014
for max. 48 FCPC adapters	2	22653015
for max. 48 SC adapters	2	23036904
for max. 48 E-2000™ adapters	2	23036905

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

CTB 19" 1 U/2 U; FIBER FRAME – UNPOPULATED

application example
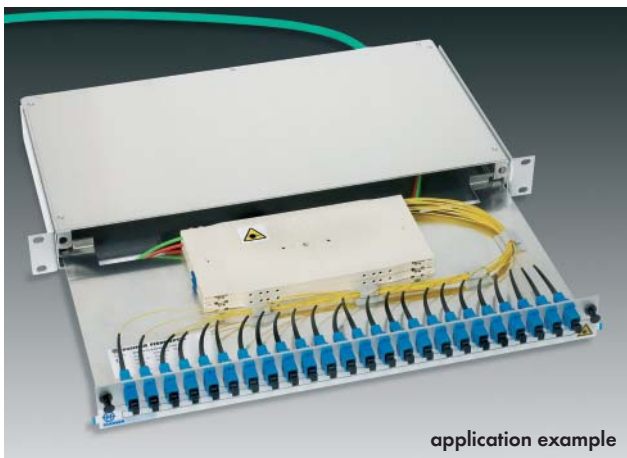
Features
- space-saving 19" rack installation
- flush or recessed (70 mm) installation
- up to 48 connectors
- telescopic, pullout tray for easy access
- easy, time-saving installation
- universal labeling system including laser warning sign
- interface for MCM splice cassette with bend radius 35 mm throughout. For standard splice holder etc. please see chapter «Splice cassettes and accessories»
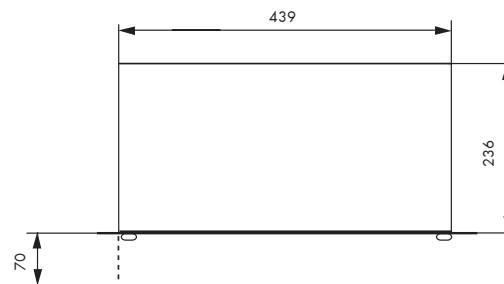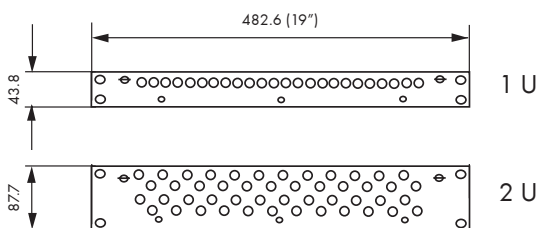
Material
- standard aluminium
- front plate: anodized aluminium

Scope of supply
- housing with cable entry and perforated plate
- labeling system
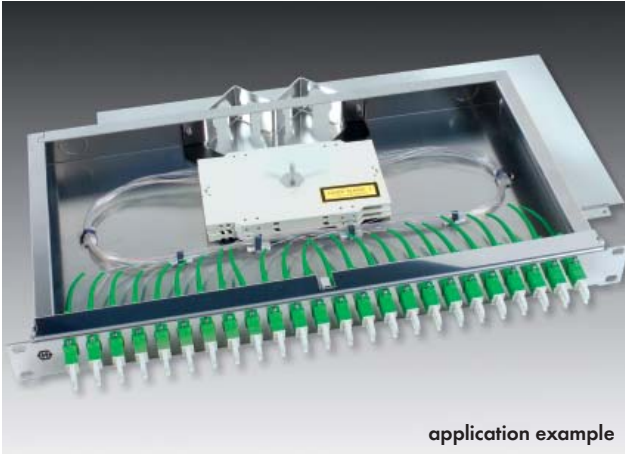- front plate
- mounting instruction

Dimensions in mm:

Unpopulated CTB's

Description	Height (U)	Item no.
for max. 20 E-2000™ adapters	1	23036903
for max. 24 ST adapters	1	22653016
for max. 24 FCPC adapters	1	22653017
for max. 24 SC adapters	1	22653018
for max. 24 E-2000™ adapters	1	22653019
for max. 12 E-2000™ duplex adapters	1	23020225
for max. 12 SC duplex adapters	1	22653020
for max. 12 LC adapters	1	23020224
for max. 12 LX.5 adapters	1	23027715
for max. 12 MT-RJ duplex adapters	1	23027714
for max. 48 ST adapters	2	22653021
for max. 48 FCPC adapters	2	23653022
for max. 48 SC adapters	2	23653023
for max. 48 E-2000™ adapters	2	23653024
for max. 24 SC duplex adapters	2	23653025

For populated CTB's please see page 139

Unpopulated CTB

LAN - Building and backbone cabling

CTB 19" 1U/2U; FIXED INSTALLATION

Types only for

application example

Features
- space-saving installation
- 12/24/48 fibers
- loose tube and pigtail overlength reserve within the housing
- diverse front plates types

Material
- aluminium natural
- front plate steel glossy finish
- labeling screenprint

Scope of supply
- housing
- cover
- splice cassette holder, 4-way (1U)
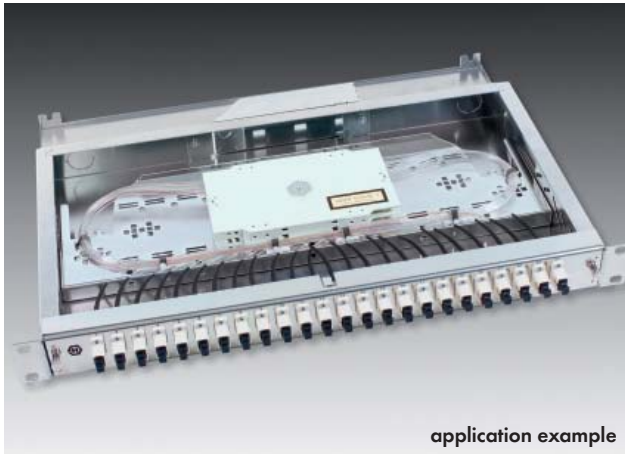- mounting set for front plate

Unpopulated CTB's

Description	Height (U)	Item no.
housing without front plate	1	24101410
front plates for CTB 19" 1 U fixed installation		
for max. 24 adapters E-2000™/SC/MT-RJ		24101411
for max. 24 adapters ST		24101412
for max. 12 adapters SC duplex vertical		24101413
for max. 12 adapters SC duplex horizontal		24101623
for max. 24 adapters FCPC		24101414
housing without front plate	2	24101420
front plates for CTB 19" 2 U fixed installation		
for max. 48 adapters E-2000™/SC/MT-RJ		24101421
for max. 48 adapters ST		24101422
for max. 24 adapters SC duplex vertical		24101423
for max. 24 adapters SC duplex horizontal		24101625

All panels can be ordered populated

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

HUBER+SUHNER FIBER OPTICS

CTB 19" 1 U/2 U; TELESCOPIC

application example

Features
- space-saving installation
- 12/24/48 fibers
- recessed installation without accessories
- pull-out style, with lock, easy access to the splice trays

Material
- aluminium natural
- front plate steel glossy finish
- labeling screenprint

Scope of supply
- housing
- cover
- splice cassette holder, 2-way (1 U) resp. 4-way (2 U), pull-out style
- mounting set for front plate

Unpopulated CTB's

Description	Height (U)	Item no.
housing without front plate	1	24101415
front plates for CTB 19" 1 U telescopic		
for max. 24 adapters E-2000™/SC/MT-RJ		24101416
for max. 24 adapters ST		24101417
for max. 12 adapters SC duplex vertical		24101418
for max. 12 adapters SC duplex horizontal		24101624
for max. 24 adapters FCPC		24101419
housing without front plate	2	24101424
front plates for CTB 19" 2 U telescopic		
for max. 48 adapters E-2000™/SC/MT-RJ		24101425
for max. 48 adapters ST		24101426
for max. 24 adapters SC duplex vertical		24101427
for max. 24 adapters SC duplex horizontal		24101626

All panels can be ordered populated

Unpopulated CTB

LAN - Building and backbone cabling
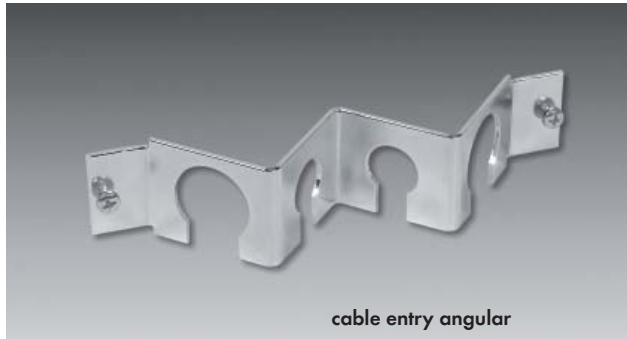
cable entry angular

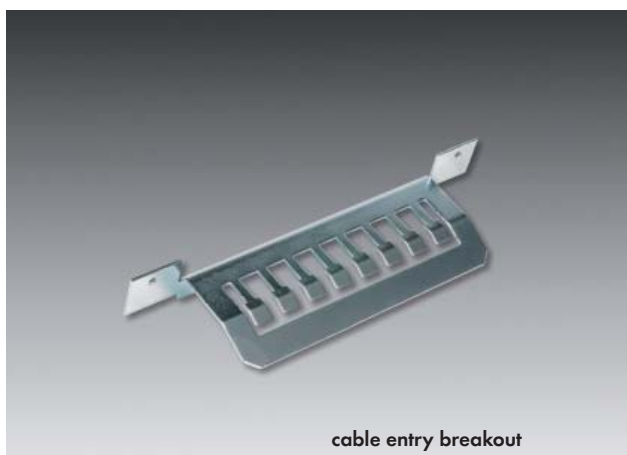| Cable entry	Unit	Item no.
for CTB and wall outlet (1 set= 4 pieces)	1 set	24101299
breakout strain relief	1	24101428
for MASTERLINE classic, 180° rotable	1	24101429
for MASTERLINE- classic divider head	1	24101474
cable entry angular	1	24101430

cable entry
MASTERLINE classic 180°

Splice cassette holder	Unit	Item no.
4-way for telescopic housing	1	24101431
4-way for fixed installation housing	1	24101428

Angle	Unit	Item no.
ETSI/2ME for housing 2 U, laminated	1	24101436
ETSI/2ME for housing 1 U, laminated	1	24101434

cable entry
MASTERLINE classic

Accessory	Unit	Item no.
blind plate for housing 1 U + 2 U	1	24101432
brush, self-adhesive	1	24101448
labeling band, alu, self-adhesive	1	24101449

cable entry breakout

splice cassette holder

LAN - Building and backbone cabling

CTB Accessories

CTB 19" TELESCOPIC AND POPULATED

Features

- space-saving installation
- 1 U with 12 or 24 fibers
- loose tube and pigtail overlength reserve within the housing
- front plates for connector types ST, SC duplex, LC duplex, E-2000™
- coloured pigtails with 12 colours acc. code
- MCM splice cassettes with bend radius limitation of 35mm
- all pigtails 50/125µm
- dimensions 483×43.6×209.5 mm (W×H×D)

Material

- steel plate coated light grey (RAL 7035)
- labeling screenprint

Scope of supply

- housing with drawer system
- MCM splice cassettes acc. fiber count
- pigtails and adaptors acc. ordering (12 or 24 fibers)
- box completely populated

Ordering information

Description	Type	Height (U)	Item no.
FO distributor 19", 1 U, telescopic, populated with connector type			
E-2000™	KEV1-12xE2000	1	24301216
E-2000™	KEV1-24xE2000	1	24301220
SC duplex	KEV1-6xSC duplex	1	24301223
SC duplex	KEV1-12xSC duplex	1	24301217
LC duplex	KEV1-6xLC duplex	1	24301222
LC duplex	KEV1-12xLC duplex	1	24301218
ST	KEV1-12xST	1	24301219
ST	KEV1-24xST	1	24301221

Populated CTB

LAN - Building and backbone cabling

![LiSA HUBER+SUHNER logo]

FO TERMINATION UNIT
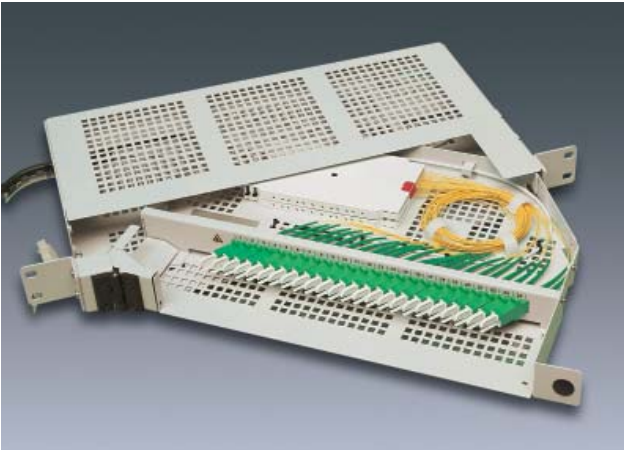
Pivotable, pre-assembled, ready for splicing
The termination unit terminates up to 24 connections and is delivered completely ready for installation and splicing.

- pivotable frame with single fiber management or 12-way splice cassette (standard)
- all cable, tube and fiber guidings are bend radius limited for a failure-free and reliable transmission
- retroactive and fast mounting of pigtails and adaptors
- integrated cable guiding for incoming and outgoing loose tubes and patchcords
- complete access to all components during operation
- universal applicable in 19" and metric racks (acc. ETSI)
- versatile loose tube feeding in the box
- optional: lock for splice and patchcord area
- easy installation during splicing by means of coloured pigtails (acc. DIN code)

Example: standard version

rack footprint
19" ETSI
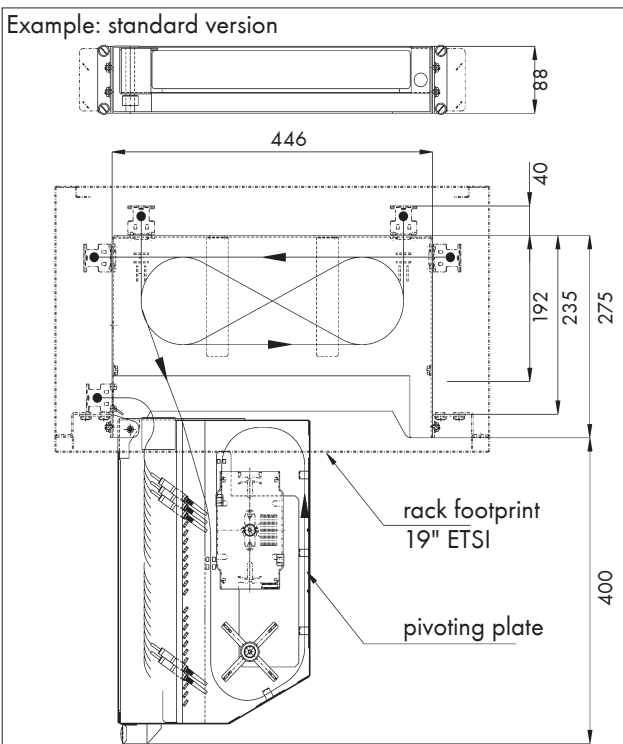
pivoting plate

Scope of supply
1 housing with cover
1 pivoting plate
1 cassette holder
populated with min. 12 customer-specified fiber or cable pigtails as well as mounted adaptors
2 cable guiding angles
2 mounting angles for metric racks
2 mounting angles for 19" racks
1 labelling band
2 splice cassettes/2 St. Fame 6-way cassettes (for F/O AE only)
pigtail ends ready for splicing and assembled in the cassettes
mounting material
assembly instruction

HUBER+SUHNER FIBER OPTICS

FO TERMINATION UNIT

Specifications

F/O AE standard/single fiber management

- 19"/metric, 2 U
- dimensions 446 x 280 mm (W x D)
- light grey, RAL 7035

F/O AEL light

- 19"/metric, 1 U
- dimensions 438 x 265 mm (W x D)
- light grey, RAL 7035

Ordering code					Description
LWL-AEL –					perforated housing (light, 1 U)
LWL-AE –					solid housing (standard, 2 U)
LWL-AEG –					perforated housing (2 U)
	93 –				code for adaptor type please see inside cover
		nn –			number of mounted pigtails and adaptors (min. 12 pcs, maximum 24)
			STD –		12-way splice cassette
			EZM –		single fiber management, Frame6 cassettes
				A –	fiber pigtails, colour coded
				K –	cable pigtails, yellow, diameter 2.4mm
					M000 mounting hole, 16.6 x 13.3 mm, for standard HUBER+SUHNER lock cylinder
					M001 mounting hole, 19.3 x 16.2 mm, for customer-specified lock cylinders
					M003 mounting hole for profile half cylinders
					M00X mounting hole for customer-specified lock cylinders (defined by HUBER+SUHNER)

Accessories

Description	Item no.
lock, equal closing, splice area or splice/patch area can be locked (2 keys, 2 latchs, assembly instruction)	LWL-AE – SGS
lock, different closing, splice area or splice/patch area can be locked (2 keys, 2 latchs, assembly instruction)	LWL-AE – SVS
main key, different closing	LWL-AE – SHS
patch cable overlength storage, 1 U, 19"/metric, bend radius limited take-up of patchcord overlength (incl. mounting accessories and assembly instruction)	LWL-AE – PÜL
distribution console, mounting and strain relief of loose tube cables in racks 19"/metric, clear breakout and loose tube guiding (incl. mounting accessories and assembly instruction)	LWL-AE – VEK
patchcord guiding angle top, bend radius limited guiding of patchcords outside of the box toward the top, within the vertical cabling area	LWL-AE – PFW
for F/O AEL (1 U): sealing cover for front plate with magnetic catch and mounting material	LWL-AE – VSD

LAN - Building and backbone cabling   Populated CTB

MASTERLINE CTB 19" 1 U/2 U, STANDARD – POPULATED
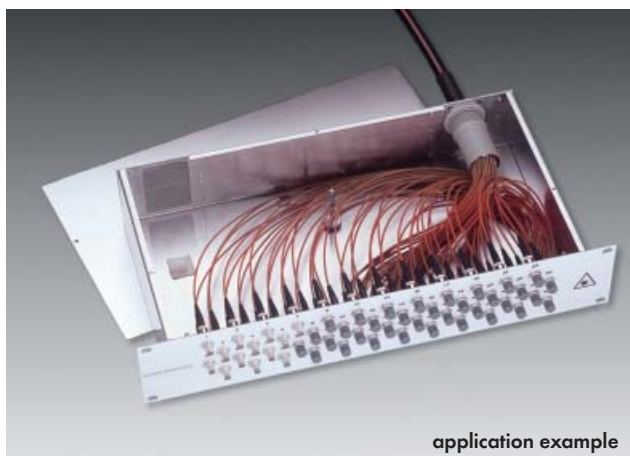
application example

Features
- cable termination box for MASTERLINE classsic 100, 500 and 600 system
- space-saving aluminium insert for 19" standard racks
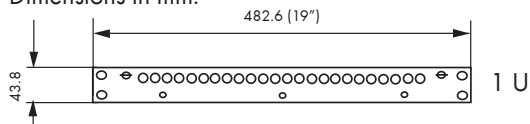- up to 48 adapter holes

Material
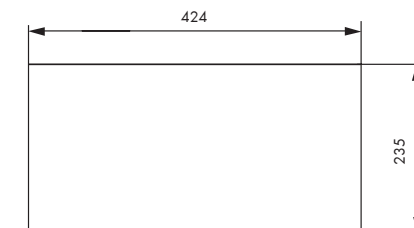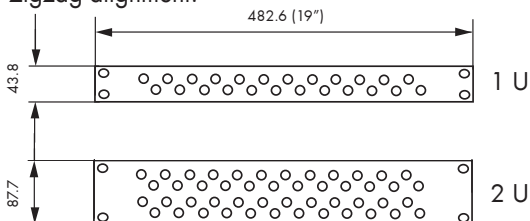- standard aluminium
- front plate: anodized aluminium

Scope of supply
- housing including cover
- front plate
- cable entry for MASTERLINE classic
- optional fixing set
- up to 48 adapters

Dimensions in mm:

43.8 — 482.6 (19") — 1 U

Zigzag alignment:

43.8 — 482.6 (19") — 1 U

87.7 — 2 U

424

235

Populated MASTERLINE CTB's

Description	Type	Height (U)
max. 20 ST adapters	KEV1-STD-FST-20-ML	1
max. 20 FCPC adapters	KEV1-STD-FCPC-20-ML	1
max. 20 SC adapters	KEV1-STD-FSC-20-ML	1
max. 20 LSH adapters	KEV1-STD-FLSH-20-ML	1

Zigzag alignment

max. 24 ST adapters	KEV1-STD-FST-24-ML	1
max. 24 FCPC adapters	KEV1-STD-FCPC-24-ML	1
max. 24 SC adapters	KEV1-STD-FSC-24-ML	1
max. 24 LSH adapters	KEV1-STD-FLSH-24-ML	1
max. 12 LC duplex adapters	KEV1-STD-FLC-24-ML	1
max. 12 LX.5 duplex adapters	KEV1-STD-LX5-24-ML	1
max. 12 SC duplex adapters	KEV1-STD-FSCD-24-ML	1
max. 48 ST adapters	KEV2-STD-FST-48-ML	2
max. 48 FCPC adapters	KEV2-STD-FCPC-48-ML	2
max. 48 SC adapters	KEV2-STD-FSC-48-ML	2
max. 48 LSH adapters	KEV2-STD-FLSH-48-ML	2

MASTERLINE CTB 19" 1 U/2 U, FIBER FRAME – POPULATED

application example
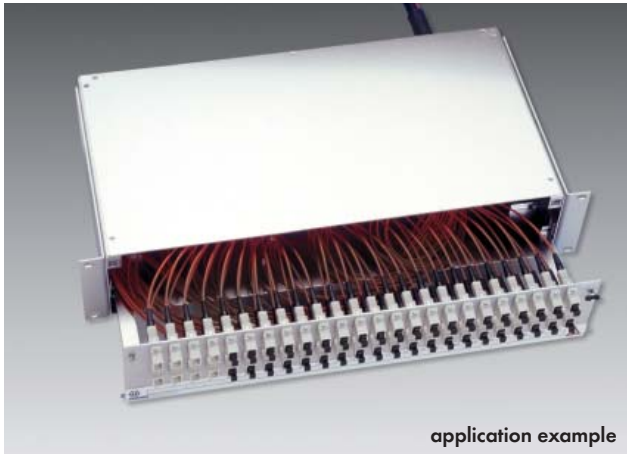
Features
- cable termination box for MASTERLINE classic 100, 500 and 600 system
- space-saving aluminium insert for 19" standard racks
- up to 48 adapter holes
- flush or recessed installation
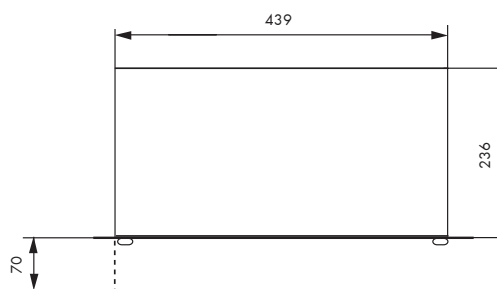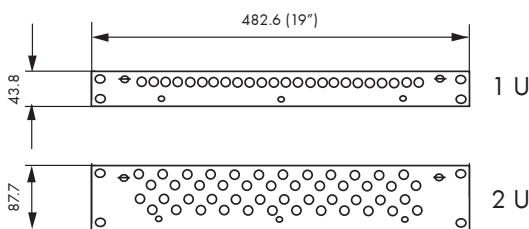- telescopic, pullout tray for easy access

Material
- standard aluminium
- front plate: anodized aluminium

Scope of supply
- housing includes cover
- front plate with up to 48 adapters
- labeling system
- cable entry for MASTERLINE classic
- optional fixing set

Dimensions in mm:

Populated CTB's

Description	Type	Height (U)
max. 24 ST adapters	KEV1-FBF-FST-24-ML	1
max. 24 FCPC adapters	KEV1-FBF-FCPC-24-ML	1
max. 24 SC adapters	KEV1-FBF-FSC-24-ML	1
max. 24 LSH adapters	KEV1-FBF-FLSH-24-ML	1
max. 12 LC duplex adapters	KEV1-FBF-FLC-24-ML	1
max. 12 LX.5 duplex adapters	KEV1-FBF-LX5-24-ML	1
max. 12 SC duplex adapters	KEV1-FBF-FSCD-24-ML	1
max. 12 LSH duplex adapters	KEV1-FBF-FLSH-24-02-ML	1
max. 20 LSH adapters	KEV1-FBF-FLSH-20-ML	1
max. 48 ST adapters	KEV2-FBF-FST-48-ML	2
max. 48 FCPC adapters	KEV2-FBF-FCPC-48-ML	2
max. 48 SC adapters	KEV2-FBF-FSC-48-ML	2
max. 48 LSH adapters	KEV2-FBF-FLSH-48-ML	2
max. 24 LC duplex adapters	KEV2-FBF-FLC-48-ML	2
max. 24 LX.5 duplex adapters	KEV2-FBF-LX5-48-ML	2
max. 24 SC duplex adapters	KEV2-FBF-FSCD-48-ML	2

MASTERLINE CONNECTION BOXES 300 AND 400 – UNPOPULATED

Connection box 300 for up to 4 divider heads Ø 31 mm

Connection box 400 for up to 14 divider heads Ø 22 mm

Connections boxes for MASTERLINE classic 100/500/600
- standard boxes hold front panels with up to 24 fibers
- for 19" rack, 1.5 Height Unit, 355 × 185 × 66 mm (without adapters and mounting plates)
- material: aluminium
- front panels are supplied along with connection boxes 300 and 400

For MASTERLINE classic 200 and 600 or connection boxes the panel type has to be specified according to the list below. The sequence of panels is defined by the order of codes in the order number.
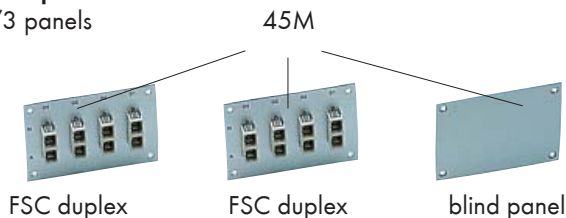
Order information for connection boxes		
300–0000–		connection box 300
400–0000–		connection box 400
	45M	example, see ordering list below
	DN	example, see ordering list below

Front panel type	Width	Position	Inscription	Code
8 times FST	1/3	left	01-04	1
		center	05-08	2
		right	09-12	3
12 times FST	1/2	left	01-06	D
		right	07-12	E
4 times FSC duplex	1/3	left	01-04	4
		center	05-08	5
		right	09-12	6
6 times FSC duplex	1/2	left	01-06	F
		right	07-12	G
8 times E-2000™	1/3	left	01-04	P
		center	05-08	Q
		right	09-12	R
12 times E-2000™	1/2	left	01-06	S
		right	07-12	T
8 times FCPC	1/3	left	01-04	U
		center	05-08	V
		right	09-12	W
12 times FCPC	1/2	left	01-06	X
		right	07-12	Y
blind panel	1/3		none	M
	1/2		none	N

Examples
1/3 panels   45M

FSC duplex   FSC duplex   blind panel

1/2 panels   DN

FST   blind panel

Upon request a connection box for 48 fibers (2.5 U) is available with front panels for ST and SC duplex adapters.

CTB ACCESSORIES
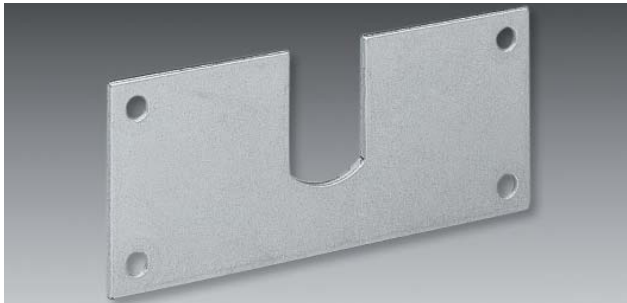
Cable entry for MASTERLINE CTB, fixing MASTERLINE classic divider

Description	Item no.
2 - 12 fibers, Ø 22 mm*	22653045
14 - 24 fibers, Ø 31 mm*	22653046
26 - 48 fibers, Ø 43 mm*	22653047

* Ø of pulling tube

Cable entry with cable gland

Description	Item no.
size M16 (Ø 4.5 - 6 mm)	23039630
size M16 (Ø 6 - 10.5 mm)	23039631
size M 20 (Ø 8 - 15 mm)	23039632
size M 25 (Ø 12.5 - 16 mm)	23039633

	Description	Item no.
1	cable entry 45° with two cable glands with antikink protection	
	Pg 7/11 (Ø 3 up to 10 mm)	22653053
	Pg 11/16 (Ø 5 up to 14 mm)	22653052
2	Backnut for MASTERLINE classic to install dividers in a hole	
	2 - 12 fibers M 16x1	23040541
	14 - 24 fibers M 26x2	22649055
	26 - 48 fibers Pg 29	22649056
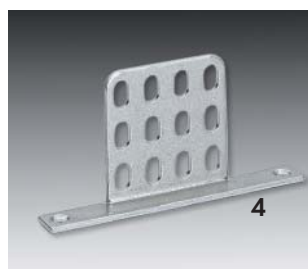
	Description	Item no.
3	dust protection cover for CTB	22653051
4	cable entry with perforated plate for CTB	22653043

Blanking caps for front panel

	Description	Unit	Item no.
5	ST	12	22653059
6	FCPC	12	22653056
7	SC, E-2000™, LX.5, MT-RJ	12	22653057
	SC duplex	12	22653054
	FSMA	12	22653058

CTB accessories

LAN - Building and backbone cabling
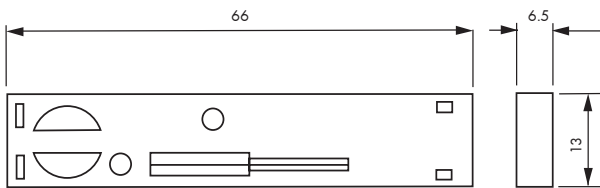
MINI CABLE DIVIDER

Compact cable dividers are suitable for the division of non-stranded multi-fiber loose tube cables in protected areas such as cable ducts, wall outlets and for the simplification of patch areas.

Description	Unit	Item no.
mini cable divider	1	22653064

Features
- easy, time-saving installation
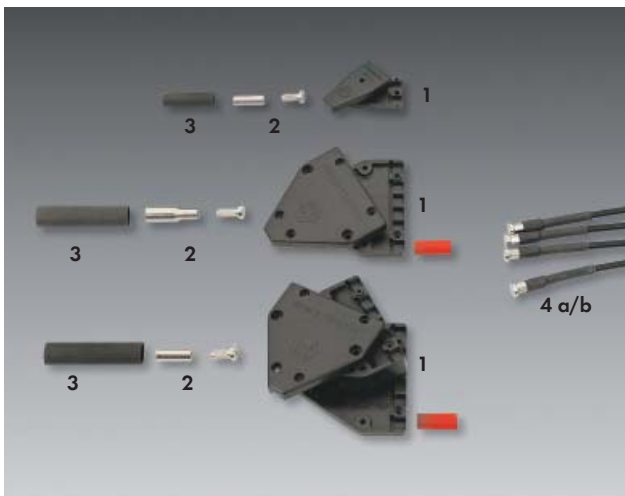- built-in fiber insertion aid
- compact design
- up to 12 fibers

Dimensions in mm:

66   6.5

13

Scope of supply
- housing
- 900 μm PE tube, 15 m
- shrink tube

CABLE DIVIDERS

Features
- allows division of multi-fiber loose tube cable with up to 12 fibers
- connectors can directly be terminated on the supplied, strain-relieved empty tube cables
- multi-fiber loose tube cables and empty tube cables are anti-rotation protected inside the divider

Scope of supply
1. housing
2. cable entry and crimp sleeve
3. shrink tube
4a. ATO/ATM/ATF:
   1 m length of fiber sleeving material with outside Ø of 3.4 mm, PE jacket black, inside Ø min. 1.0 mm, insertion of fibers
4b. ATOS/ATMS:
   1 m length of fiber sleeving material with outside Ø of 2.1 mm, LSFH jacket black, inside Ø min. 0.55 mm, insertion of standard and H200 fibers

Not included:
Glue to fix cable jacket of glass-armoured and field cables

Type	Cable divider
ATO...	for non-armoured mulit-fiber loose tube cables
ATM...	for glass-armoured mulit-fiber loose tube cables
ATF	for field cables; for insertion of 0.9 mm tubes

Cable divider

Divider	Use with following cable types	Diameter [mm]	Dimensions [L×W×H]	Type 3.4 mm	Type 2.1 mm	Unit
2 way	02-2..../...(ZN)...	5.0	40 × 21 × 11	ATO-BK-2	ATOS-BK-2	1
	02-2..../W(ZNG)...	8.5	40 × 21 × 11	ATM-BK-2	ATMS-BK-2	1
	02-.../FSN(ZN)Z-...	6.0	40 × 21 × 11	ATF-BK-2	–	1
4 way	04-4..../...(ZN)...	5.0	60 × 60 × 11	ATO-BK-4	ATOS-BK-4	1
	04-4..../W(ZNG)...	8.5	60 × 60 × 11	ATM-BK-4	ATMS-BK-4	1
	04-.../FSN(ZN)Z-...	6.0	60 × 60 × 11	ATF-BK-4	–	1
6 way	06-6..../...(ZN)...	5.0	60 × 60 × 11	ATO-BK-6	ATOS-BK-6	1
	06-6..../W(ZNG)...	8.5	60 × 60 × 11	ATM-BK-6	ATMS-BK-6	1
10 way	10-10..../...(ZN)...	5.0	60 × 60 × 22	ATO-BK-10	ATOS-BK-10	1
	10-10..../W(ZNG)...	8.5	60 × 60 × 22	ATM-BK-10	ATMS-BK-10	1
12 way	12-12..../...(ZN)...	5.0	60 × 60 × 22	ATO-BK-12	ATOS-BK-12	1
	12-12..../W(ZNG)...	8.5	60 × 60 × 22	ATM-BK-12	ATMS-BK-12	1
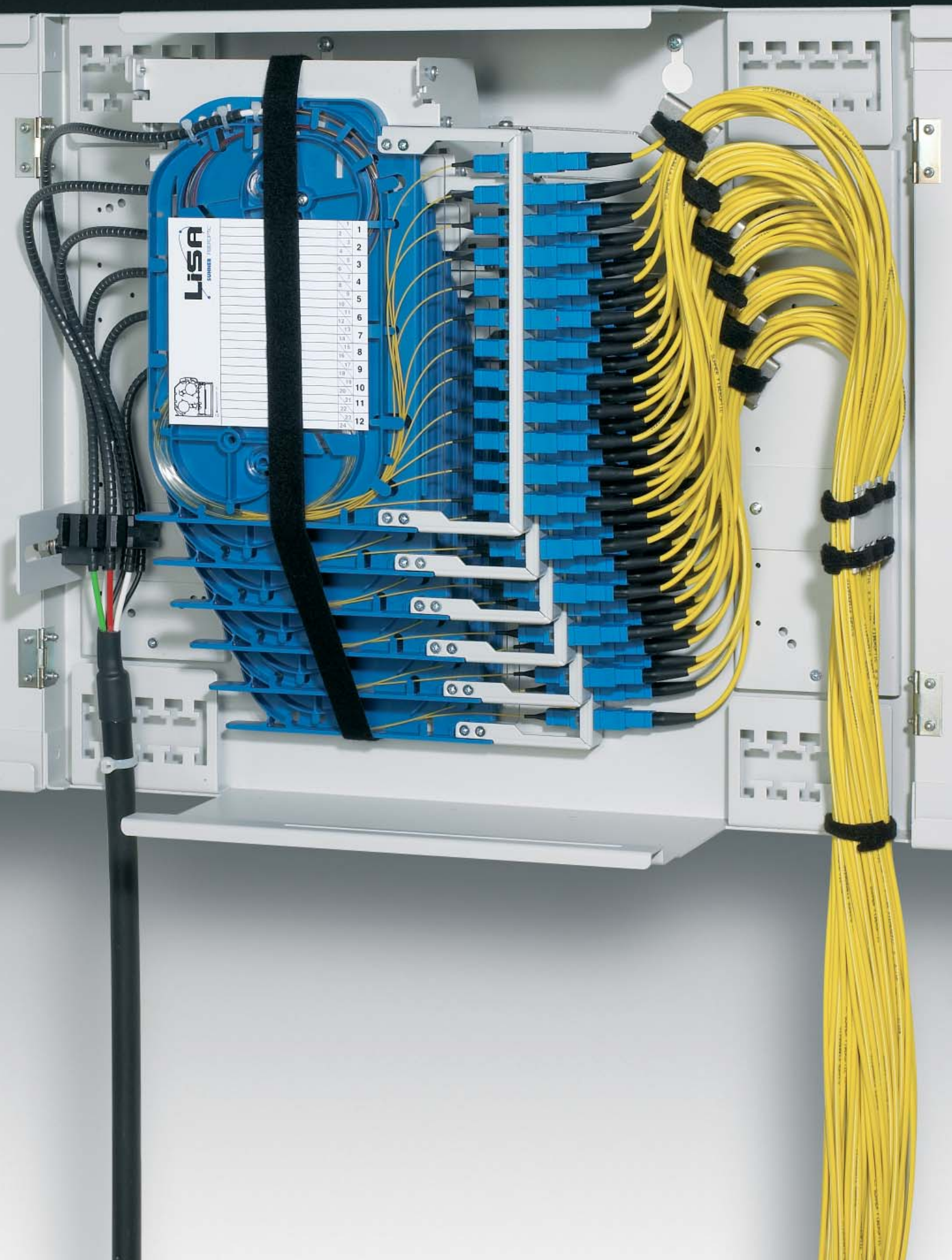
LAN – HORIZONTAL CABLING

Wall box WB425
page 156

Wall box WBC
page 160

Wall box WBH
page 164

**Outdoor wall boxes
WBOC/WBO**
see chapter
«WAN - Network termination»
page 121

LAN - Horizontal cabling

WALL BOX WB425

General Features

- many different configuration variants of fiber connections
- splice variants with MultiCircuit Management (MCM) or SingleCircuit Management (SCM)
- every splice cassette individually accessible for easy fiber access
- bend radius limitation of 35 mm for fibers
- boxes can be arranged on top of each other
- removable side walls
- optional one or two door variant
- customer / subscriber separation secured with different key
- various top or bottom cable entry possibilities
- optional cable entry plates for cable glands and brush cover

- wall mounting at 3 points
- for indoor applications
- robust steel housing, sidewalls and doors
- powder coated light grey (RAL 7035)
- dimensions: 425 × 425 × 127 mm (W × H × D)

3 different basic configurations can be achieved:
- splice through
- splice/patch
- patch through

WALL BOX WB425

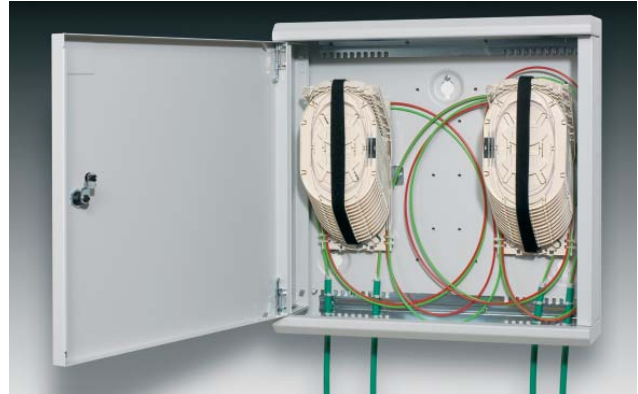### Splice through variants

- max. 144 splices with MCM (12 cassettes)

- max. 48 splices with SCM (24 cassettes)

Splice/patch variants

- max. 72 splices with MCM (6 cassettes)
- max. 48 patch connections with MCM

- max. 24 splices with SCM (12 cassettes)
- max. 48 patch connections with SCM

Patch through variant

- max. 48 fiber connections

WB425

LAN - Horizontal cabling

WALL BOX WB425

Ordering code							Description
WB425-							Wall Box 425
	APL-						adapter plate fitted, for patch through only
	MCM-						MultiCircuit Management
	SCM-						SingleCircuit Management
		00-					for patch through only
		12-					number of cassettes splice through variant: max. 12 MCM, 24 SCM splice/patch variant: max. 6 MCM, 12 SCM
			00/				code for adapter type, see inside back cover
				09-			singlemode 9 µm
				50-			multimode 50 µm
				62-			multimode 62.5 µm
					nn-		number of adapters (max. 48)
						SW0-	sandwich splice protection holder (splice protectors not included)
						HS0-	heatshrink splice protection holder (splice protectors not included)
						A	1 door
						B	$^1/_3$ - $^2/_3$ doors
						10	standard variant

Notes: Pigtails are installed in the box according to the drawing here below
MASTERLINE and patchcords have to be ordered separately, see chapter «Connectivity»

Standard installation of pigtails in **MCM** splice cassettes (top view)

MCM splice cassettes   number of adapters
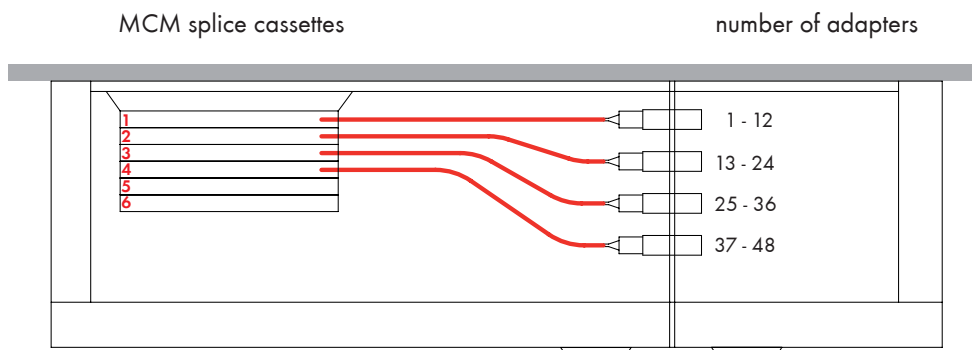
The first 12 pigtails are installed in the first, lowest splice cassette, the next 12 pigtails in the second cassette, etc.

Note: deviations of pigtail allocation have to be specified explicitly.

WB425

LAN - Horizontal cabling

WB425 ACCESSORIES
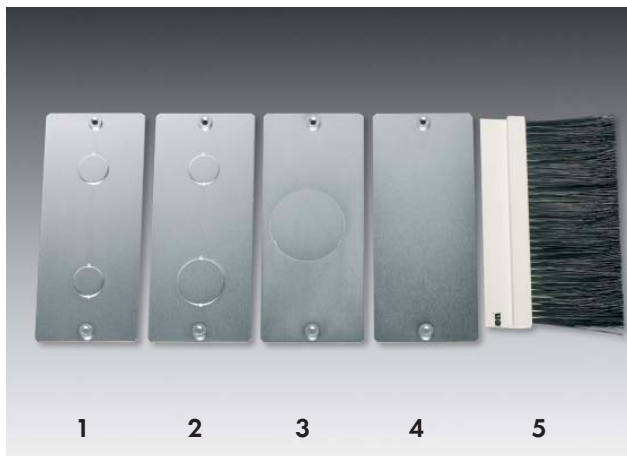
Optional parts

	Description	Unit	Item no.
1	cable entry for 2×M16 incl. mounting screws WB425-CBL-2×M16-A1	1	84005698
2	cable entry for 1×M16+1×M25 incl. mounting screws WB425-CBL-1×M16/1×M25-A1	1	84005696
3	cable entry for 1×M40 incl. mounting screws WB425-CBL-1×M40-A1	1	84005694
4	blind plate at cable entry point incl. mounting screws WB425-CBL-BLIND-A1	1	84005700
5	cable entry with brush WB425-BRUSH-A1	1	84005692
6	cable ties small, white (2.5 × 99 mm) fixed batch quantity = 100	1	23218200

Cable glands are not included in the scope of supply.

Standard installation of pigtails in **SCM** splice cassettes (top view)

SCM splice cassettes   number of adapters

The first 2 pigtails are installed in the first, lowest splice cassette, the next 2 pigtails in the second cassette, etc.

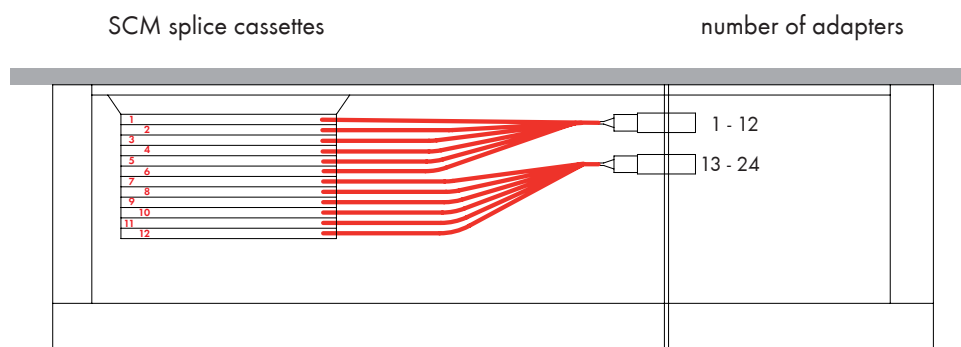Note: deviations of pigtail allocation have to be specified explicitly.

WALL BOX WBC

General Features

- different configuration variants of fiber connections
- every fiber tray individually accessible for easy fiber access
- bend radius limitation of 30 mm for fibers
- boxes can be arranged on top of each other
- 2 lockable wardrobe doors
- customer / subscriber separation secured with different key
- various top or bottom cable entry possibilities
- optional cable entry with glands
- wall mounting at 4 points

- for indoor applications
- robust steel construction
- powder coated light grey (RAL 7035)
- compact outer dimensions 400 × 270 × 58 mm (W×H×D)

3 different basic configurations can be achieved:
- splice through
- splice/patch
- patch through

WALL BOX COMPACT – SPLICE VARIANTS

Splice through

Specific features
- max. 24 splices with 2 cassettes
- hinged fiber trays for instant fiber access
- accommodates max. 2 fiber trays

## Splice/patch

Specific features
- max. 24 splices, resp. 48 with SFF with 2 cassettes
- hinged fiber trays for instant fiber access
- accommodates max. 2 fiber trays
- includes MASTERLINE gland bracket and cable glands PG9 and PG13.5 with antikink protection

Ordering code										Description
WBC–										Wall Box Compact
	FTR									Fiber Tray Right handed
		B–								blue
		Y–								yellow
		G–								grey
		O–								orange
		GN–								green
		A-								turquoise
		R-								red
			NX–							no adapter plate for splice through applications
			20–							code for adapter type, see inside back cover
				nn–						number of splices per tray (splice through), number of adapters per tray (splice/patch), 12 = standard
					00–					no pigtails
					09–					singlemode 9 µm
					50–					multimode 50 µm
					62–					multimode 62.5 µm
						A–				small splice bridge for max. 24 × 250 µm splices (including heatshrink splice protectors)
						B–				ANT sandwich splice bridge (sandwich splice protectors not included)
							nn–			number of fiber trays per box, max. 2
								B–		brush strip fitted
									WT–	polypropylene conduit, white
									A1	standard variante

Note: MASTERLINE and patchcords have to be ordered separately, see chapter «Connectivity».

WBC

LAN - Horizontal cabling

WALL BOX COMPACT – PATCH THROUGH VARIANT

Patch through
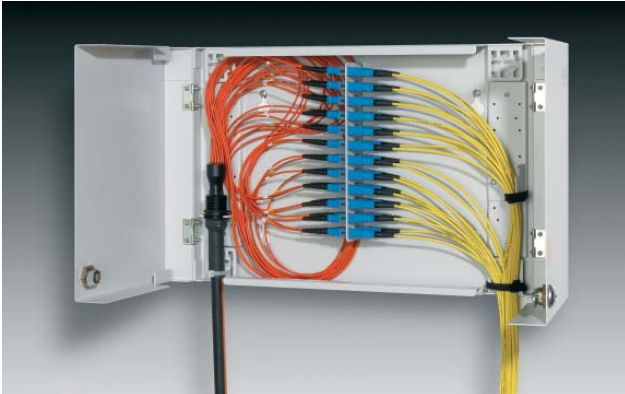
Specific features

• max. 24 fiber connections, resp. 48 with SFF

• for direct connection with MASTERLINE and/or patch-
cords

• MASTERLINE snap-in gland design for fast installation

Ordering code									Description
WBC–									Wall Box Compact
	APL–								adapter plate fitted
		XX–							code for adapter type, see inside back cover
			nn–						number of adapters, max. 24
				SM–					singlemode
				MM–					multimode
					O				no bracket required left side (cable fixing with cable ties)
					S				small bracket left side for small MASTERLINE or PG9 cable gland
					M				medium bracket left side for medium MASTERLINE or PG13.5 cable gland
					P				patchcord guide left side
						n/			number of brackets required left side, max. 2
							O		no bracket required right side (cable fixing with cable ties)
							S		small bracket right side for small MASTERLINE or PG9 cable gland
							M		medium bracket right side for medium MASTERLINE or PG13.5 cable gland
							P		patchcord guide right side
								n–	number of brackets required right side, max. 2
								B–	brush strip entry
								A1	standard variant

Note: MASTERLINE and patchcords have to be ordered separately, see chapter «Connectivity».
The above mentioned brackets fix MASTERLINE classic dividers

WALL BOX COMPACT – ACCESSORIES

Patchcord guide	Unit.	Item no.
WBC-PCG-STA-A1	1	84004958

Features
- steel
- powder coated, light grey (RAL 7035)
- includes 4 Velcro ties and 2 fixing screws

	Description	Unit	Item no.
1	MASTERLINE gland bracket WB-M-MGB/PG9/PG13.5-1-A1	1	84004219
2	cable gland PG9, with antikink protection and counternut, black, for cable Ø 4 - 8 mm CABLE-GLAND-BLK-PG9	1	84009991
2	cable gland PG13.5, with antikink protection and counternut, black, for cable Ø 6 - 12 mm CABLE-GLAND-BLK-PG13.5	1	84009992

Features gland bracket
- fixing a small or medium MASTERLINE classic divider, resp. cables with a cable gland PG9 (Ø 4 – 8) or PG13.5 (Ø 6 – 12)
- steel powder coated
- light grey (RAL 7035)
- includes 2 fixing screws

WBC

LAN - Horizontal cabling

WALL BOX HIGH CAPACITY WBH

General Features

- different configuration variants of fiber connections
- every fiber tray individually accessible for easy fiber access
- bend radius limitation of 30 mm for fibers
- boxes can be arranged on top of each other
- 2 lockable wardrobe doors
- customer / subscriber separation secured with different key
- various top or bottom cable entry possibilities
- wall mounting at 4 points

- for indoor applications
- robust steel construction
- powder coated light grey (RAL 7035)
- dimensions 448 × 395 × 148 mm (W×H×D)

3 different basic configurations can be achieved:
- splice through
- splice/patch
- patch through

WALL BOX HIGH CAPACITY – SPLICE VARIANTS

Splice through

Specific features
- max. 72 splices with 6 cassettes
- hinged fiber trays for instant fiber access
- accommodates max. 6 fiber trays

Splice/patch

Specific features
- max. 72 splices, resp. 144 with SFF with 6 cassettes
- hinged fiber trays for instant fiber access
- accommodates max. 6 fiber trays

Ordering code									Description
WBH –									Wall Box High Capacity
	FTR								Fiber Tray Right handed
		B –							blue
		Y –							yellow
		G –							grey
		O –							orange
		GN –							green
		A -							turqoise
		R -							red
			NX –						no adaper plate for splice through applications
			20 –						code for adaptor type, see inside back cover
				nn –					number of splices per tray (splice through), number of adapters per tray (splice/patch), 12 = standard
					00 –				no pigtails
					09 –				singlemode 9 µm
					50 –				multimode 50 µm
					62 –				multimode 62.5 µm
						A –			small splice bridge for max. 24 × 250 µm splices (including heatschrink splice protectors)
						B –			ANT sandwich splice bridge (sandwich splice protectors not included)
							nn –		number of fiber trays per box, max. 2
								B –	brush strip fitted
								WT –	polypropylene conduit, white
								A1	standard variante

Note: MASTERLINE and patchcords have to be ordered separately, see chapter «Connectivity».

WBH

LAN - Horizontal cabling

WALL BOX HIGH CAPACITY – PATCH THROUGH VARIANT

Patch through

Specific features

- max. 72 fiber connections, resp. 144 with SFF
- for direct connection with MASTERLINE and/or patch-cords
- MASTERLINE snap-in gland design for fast installation

Ordering code										Description
WBH–										Wall Box High Capacity
	APL–									adapter plate fitted
		XX–								code for adapter type, see inside back cover
			nn–							number of adapters, max. 72
				SM–						singlemode
				MM–						multimode
					0					no bracket required left side (cable fixing with cable ties)
					S					small bracket left side for small MASTERLINE or PG9 cable gland
					M					medium bracket left side for medium MASTERLINE or PG13.5 cable gland
					L					large bracket left side for large MASTERLINE only
					P					patchcord guide left side
						n/				number of brackets required left side, max. 2
							0			no bracket required right side (cable fixing with cable ties)
							S			small bracket right side for small MASTERLINE or PG9 cable gland
							M			medium bracket right side for medium MASTERLINE or PG13.5 cable gland
							L			large bracket right side for large MASTERLINE only
							P			patchcord guide right side
								n–		number of brackets required right side, max. 2
									B–	brush strip entry
									A1	standard variant

Note: MASTERLINE and patchcords have to be ordered separately, see chapter «Connectivity».
The above mentioned brackets fix MASTERLINE classic dividers

WALL BOX HIGH CAPACITY – ACCESSORIES
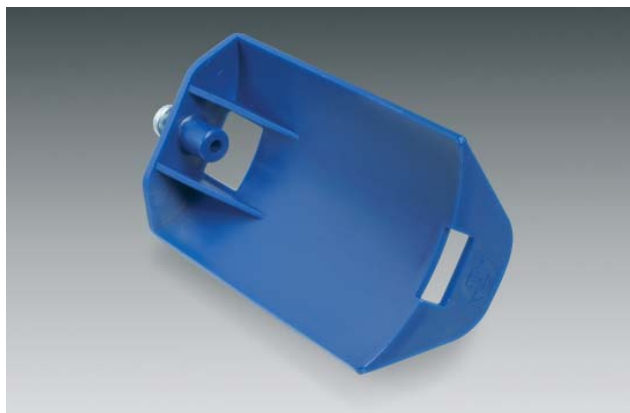
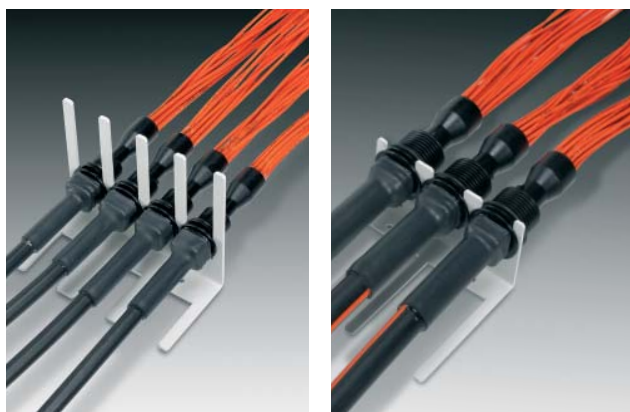| Bend radius limiter	Unit.	Item no.
ODRF-SUBR-BEND-8M/4S-A1	8	84002996

Features
- radius 35 mm
- for patchcords
- material HDPE, halogen free
- blue (RAL 5005)
- supplied with screws

Patchcord guide	Unit	Item no.
WBH-PCG-STA-A1	1	84004954

Features
- steel
- powder coated, light grey (RAL 7035)
- includes 12 Velcro ties and 2 fixing screws

MASTERLINE gland bracket	Unit	Item no.
WBH-M/S-MGB-3/12-A1	1	84004296

Features
- to fix 12 small or 3 medium MASTERLINE classic dividers
- steel
- powder coated, light grey (RAL 7035)
- includes 2 fixing screws

MASTERLINE gland bracket	Unit	Item no.
WBH-L-MGB-2-A1	1	84004290

Features
- to fix 2 large MASTERLINE classic dividers
- steel
- powder coated, light grey (RAL 7035)
- includes 2 fixing screws

SPLICE CASSETTES AND ACCESSORIES
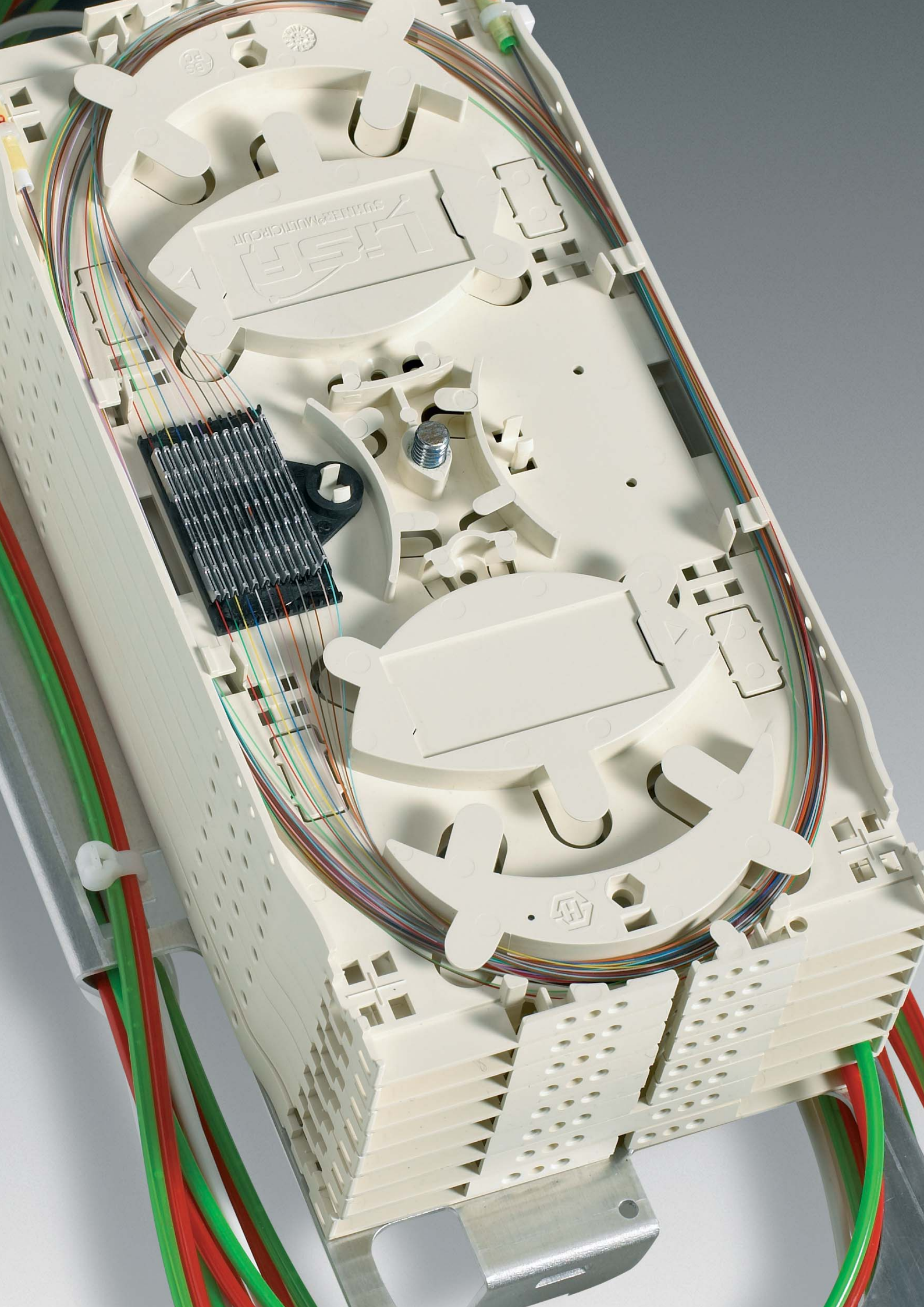
Splice cassettes and accessories
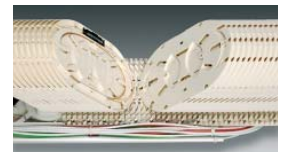
MULTICIRCUIT SPLICE CASSETTE
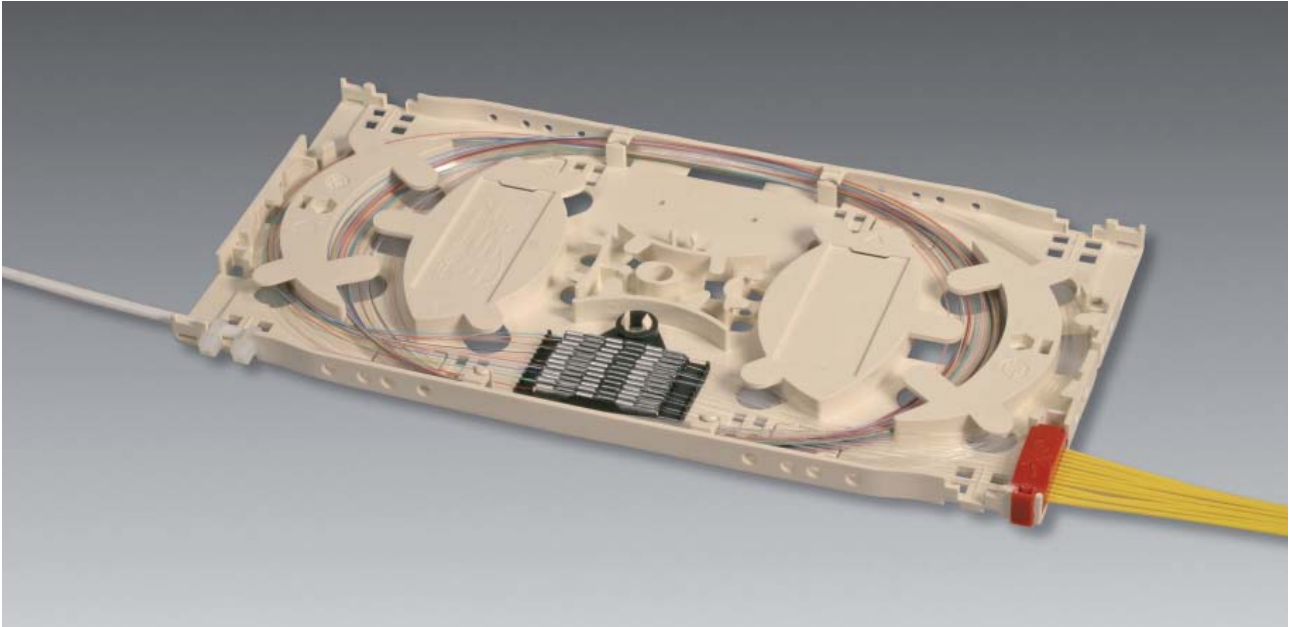
Using the MultiCircuit Management (MCM) splice cassette makes the handling of fiber easier. An integrated bend radius limitation of 35mm, for DWDM applications for example, secures the long-term performance of optical fibers without loss caused by micro-bending.

A large range of entry possibilities and cassette break outs for loose tubes and fibers, make the HUBER+SUHNER splice cassette a suitable tool for all telecom and LAN applications.

Splice cassettes are integrated in MCM compact modules, splice closures and connection termination boxes.

Features
- minimum bend radius of 35 mm throughout
- max. 24 splice connections with sandwich and max. 12 with heat shrink splice protection
- for all standard splice holders
- integrated cross-over field
- two separate fiber storage areas
- anti-twist feature when stacking cassettes
- fiber and loose tube entry possibilities from all four sides
- standard fixing points (incl. central bolt fixing)
- snap on lid
- generous labeling fields in the cassette and on the lid
- optional hinges for "book system", for all sides

Material
- ABS/PC
- halogen free and flame-retardant (UL94 V-0)
- colour pearl white (RAL 1013)

| Description	Unit	Item no.
LISA MCM splice cassette, empty CAS-MCM-BODY-A1	4	23039730
lid for LISA MCM splice cassette CAS-MCM-COVER-A1 incl. laser sign	1	23039731

MULTICIRCUIT SPLICE CASSETTE

| Hinge for book system	Unit	Item no.
CAS-MCM-HINGE-A1	10	23039732

Features
- removable hinges
- two hinges on one side of the splice cassette as a centre of rotation
- one hinge on the opposite side as a lock
- recommended maximal connected splice cassettes: 6

splice cassette
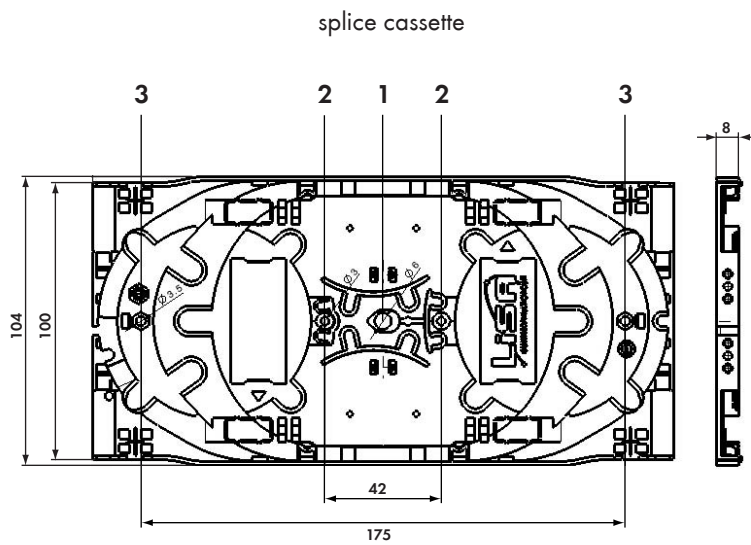
1 hole size Ø = 6.0 mm, fixing type M5

2 hole size Ø = 2.9 mm, fixing type countersunk M3

3 hole size Ø = 3.5 mm, fixing type M3 screw and nut

cassette lid

hinge
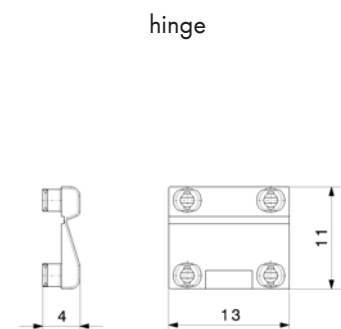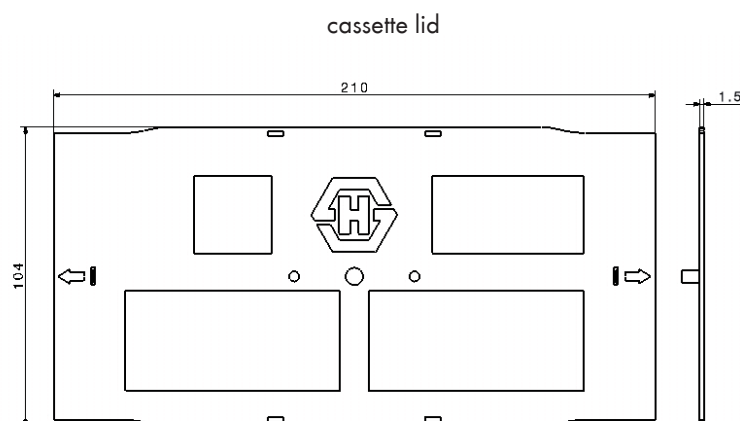
MULTICIRCUIT ACCESSORIES
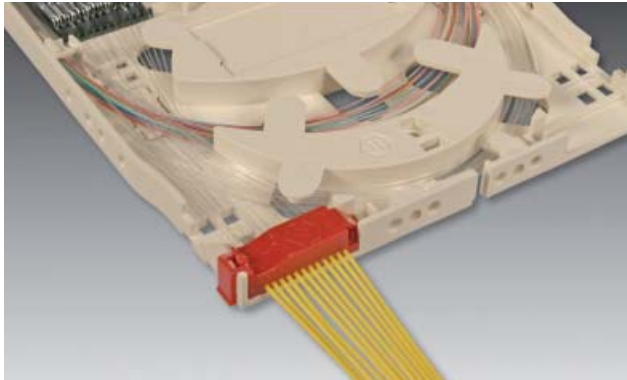
Pigtail strain relief	Unit	Item no.
SPL-CAS-PSTR-09-A1	10	84019116

- for pigtails Ø 0.9 mm
- up to twelve pigtails (0.9 mm) can be strain relieved individually and reliably
- optimal fixing of the pigtails by means of cover
- cover can be opened by snap mechanism
- fast mounting in the LISA splice cassette MCM and SCM base module S
- One-Piece-Design
- insertion of the pigtails without a tool
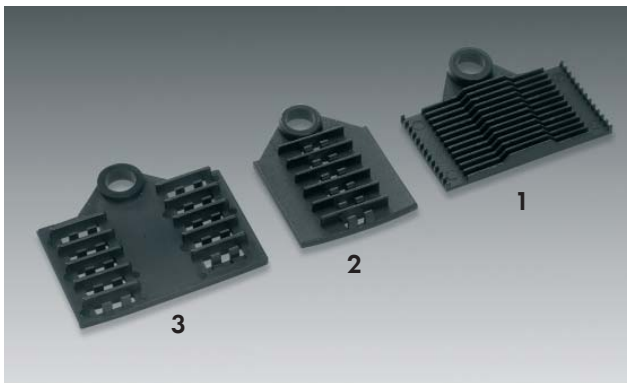
	Description	Unit	Item no.
1	splice holder for ANT sandwich splice protection 12-way SPL-MCM-COMB-SW-12-A1	10	84004068
2	splice holder for shrink splice protection 45/60 mm 6-way, Ø 3 mm SPL-MCM-COMB-HS-06-A1	10	84004066
3	splice holder for shrink splice protection 23 mm 10-way, Ø 3 mm SPL-HT-ST-10	10	22653039
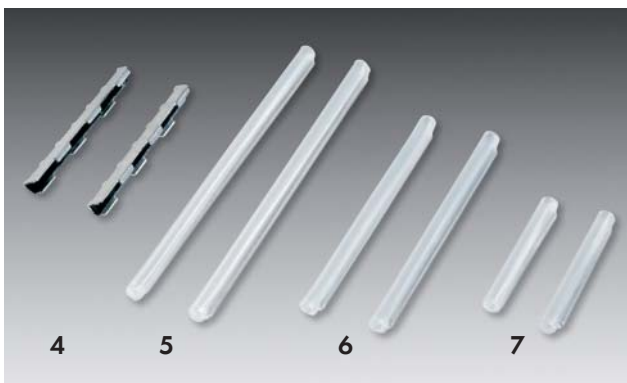
	Description	Unit	Item no.
4	ANT sandwich splice protection SPLPR-SW-30 dimensions 1.2 × 3.2 × 30 mm • recommended for LISA	150	84005554
5	shrink splice protection SPLPR-HS-60 dimensions Ø 3 mm × 60 mm	100	84005212
6	shrink splice protection SPLPR-HS-45 dimensions Ø 3 mm × 45 mm • recommended for LISA	100	84005211
7	shrink splice protection SPLPR-HS-23 dimensions Ø 3 mm × 23 mm	100	84005210

SINGLECIRCUIT MANAGEMENT SYSTEM
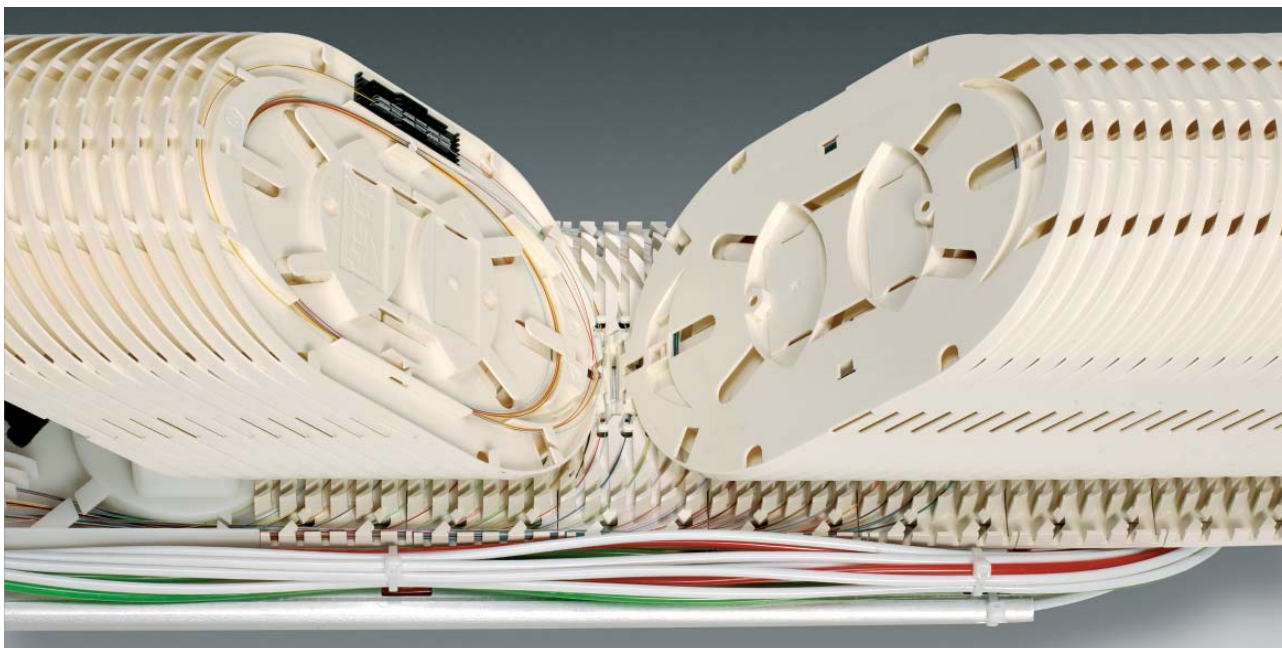
SingleCircuit Management (SCM) for specialised applications with higher handling and reliability requirements, subscriber networks carrying sensitive or high volume traffic, networks which experience a high customer turnover or those that are frequently restructured.

Access to the fibers is possible by folding away neighbouring cassettes, all previously spliced fibers remain undisturbed.

The bend radius limitation of 35 mm secures the long-term performance of optical fibers without loss caused by micro-bending.

Features Modules
- minimum bend radius 35 mm throughout the module
- open fiber guidance through the whole module (without insertion through guiding holes)
- fiber connection from one cassette to another one
- conversion from SingleCircuit to MultiCircuit fiber management without changing cassettes
- capacity increase by adding further expansion modules

Features of splice cassette
- minimum bending radius 35mm throughout
- typically accepting 2 x splices per cassette
- splice connections capacity per cassette max. 6 with sandwich resp. with heat shrink splice protectors
- conversion to MCM splice cassette by simply adding a second splice holder
- integrated pigtail fixing 0.9 mm
- insertion of max. 2 pigtails
- robust hinge
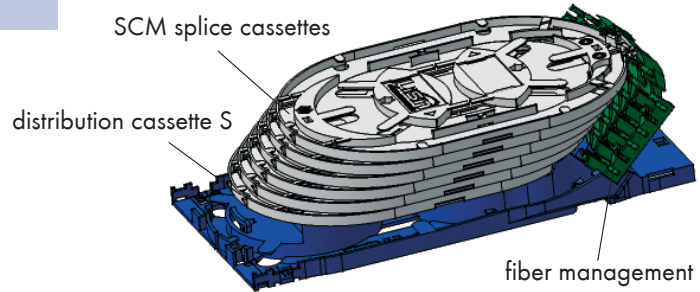- cross-over field
- two labeling areas

Material
- ABS/PC
- halogen free and flame-retardant (UL94 V-0)
- colour pearl white (RAL 1013)

SingleCircuit

Splice cassettes and accessories

SINGLECIRCUIT MANAGEMENT SYSTEM

Stack fitting

for example in

- compact modules
- wall distribution boxes
- small distribution boxes

SCM splice cassettes

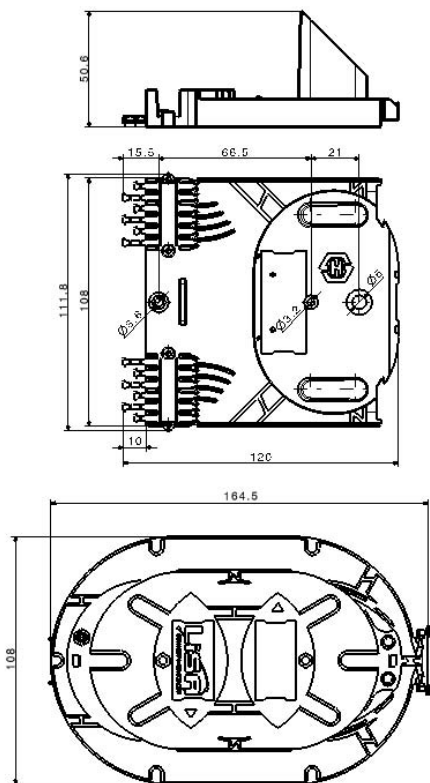distribution cassette S

fiber management

Horizontal fitting

for example in

- dome closures
- splicing boxes (horizontal construction)
- wall distribution boxes
- large distribution boxes

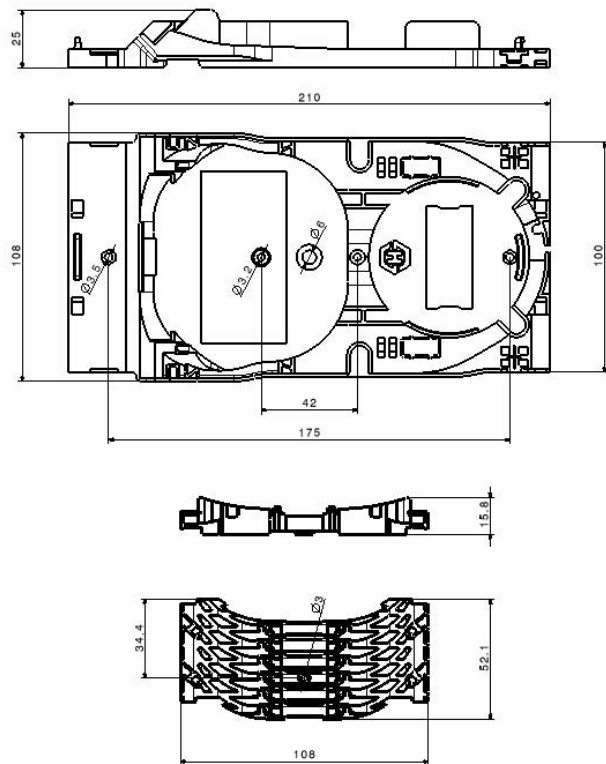SCM splice cassettes

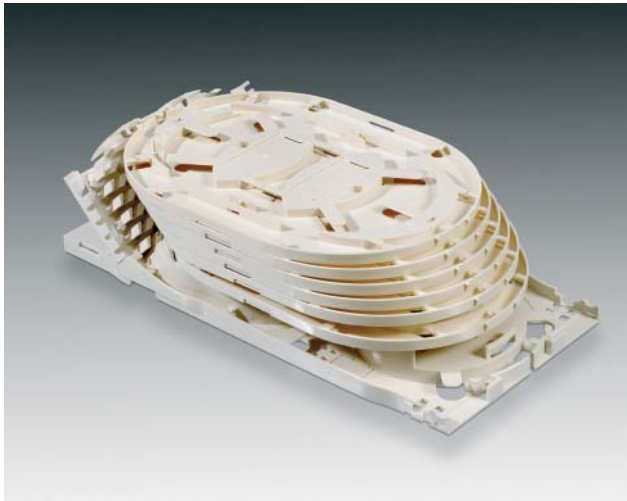distribution cassette H   fiber management
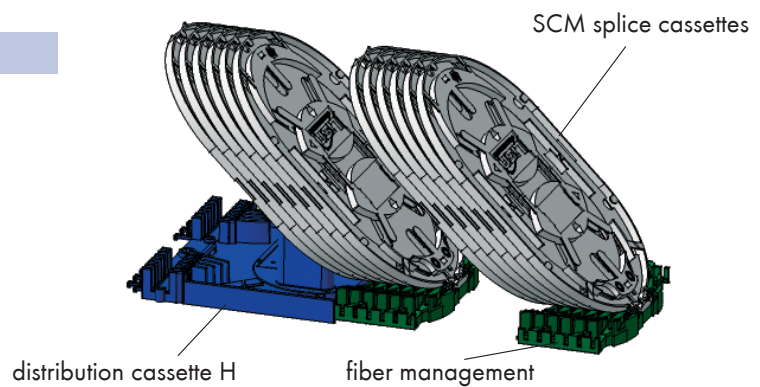
SCM distribution cassette H   SCM distribution cassette S

SCM splice cassette   SCM fiber management

SINGLECIRCUIT SPLICE MODULES

SCM base module S	Unit	Item no.
CAS-SCM-BASIC-S-A1	1	23039734

Distribution cassette S including 6 SCM splice cassettes and 1 fiber management for angled fiber management

Features
- expansion with 1 expansion module and plate
- entry fixing for max. 4 loose tubes
- cross-over field
- optional pigtail strain relief for 12 fibers
- labeling area

SCM base module H	Unit	Item no.
CAS-SCM-BASIC-H-A1	1	23039733

Distribution cassette H including 6 SCM splice cassettes and 1 fiber management for horizontal fiber management

Features
- entry fixing for max. 36 loose tubes
- two separate areas for loose tube feeding
- labeling area
- to fix humid measuring sensor

SCM expansion module	Unit	Item no.
CAS-SCM-EXTEND-A1	1	23039735

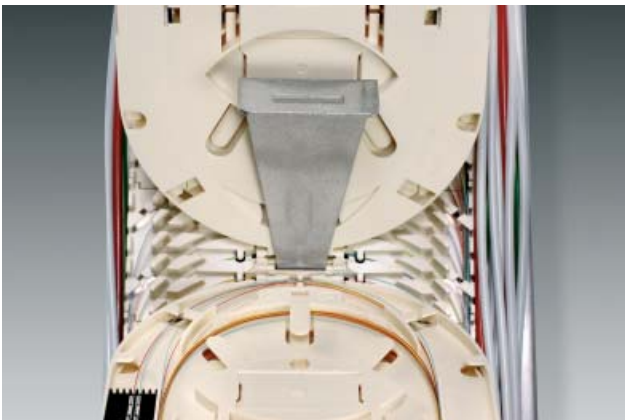6 SCM splice cassettes and 1 fiber management for connection to a SCM base modul H or S

SingleCircuit

Splice cassettes and accessories

SINGLECIRCUIT ACCESSORIES

SCM supporting plate	Unit	Item no.
CAS-SCM-ACC-SUPP-A1	1	84003771

Features
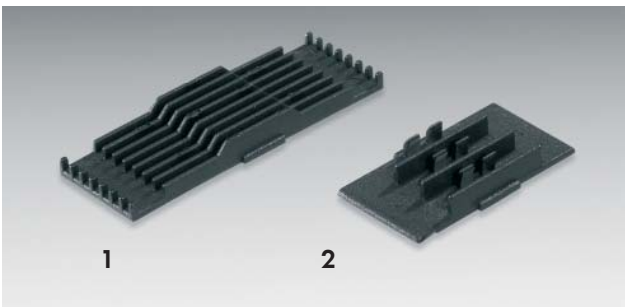- to support the fiber management by expanding a SCM base module S with 1 SCM expansion module

SCM locking plate	Unit	Item no.
CAS-SCM-ACC-LOCK-A1	1	84003773

Features
- to lock SCM splice cassettes in position during installation of fibers in cassettes lying beneath

	Description	Unit	Item no.
1	sandwich splice holder 6-way SPL-SCM-COMB-SW-06-A1	6	84004065
2	heat shrink splice holder 3-way SPL-SCM-COMB-HS-03-A1	6	84004064

	Description	Unit	Item no.
3	heat shrink splice protectors SPLPR-HS-45 size Ø 3 mm × 45 mm • recommended for LISA	100	84005211
4	heat shrink splice protectors SPLPR-HS-23 size Ø 3 × 23 mm	100	84005210
5	sandwich splice protectors SPLPR-SW-30, type ANT size 1.2 × 3.2 × 30 mm • recommended for LISA	150	84005554
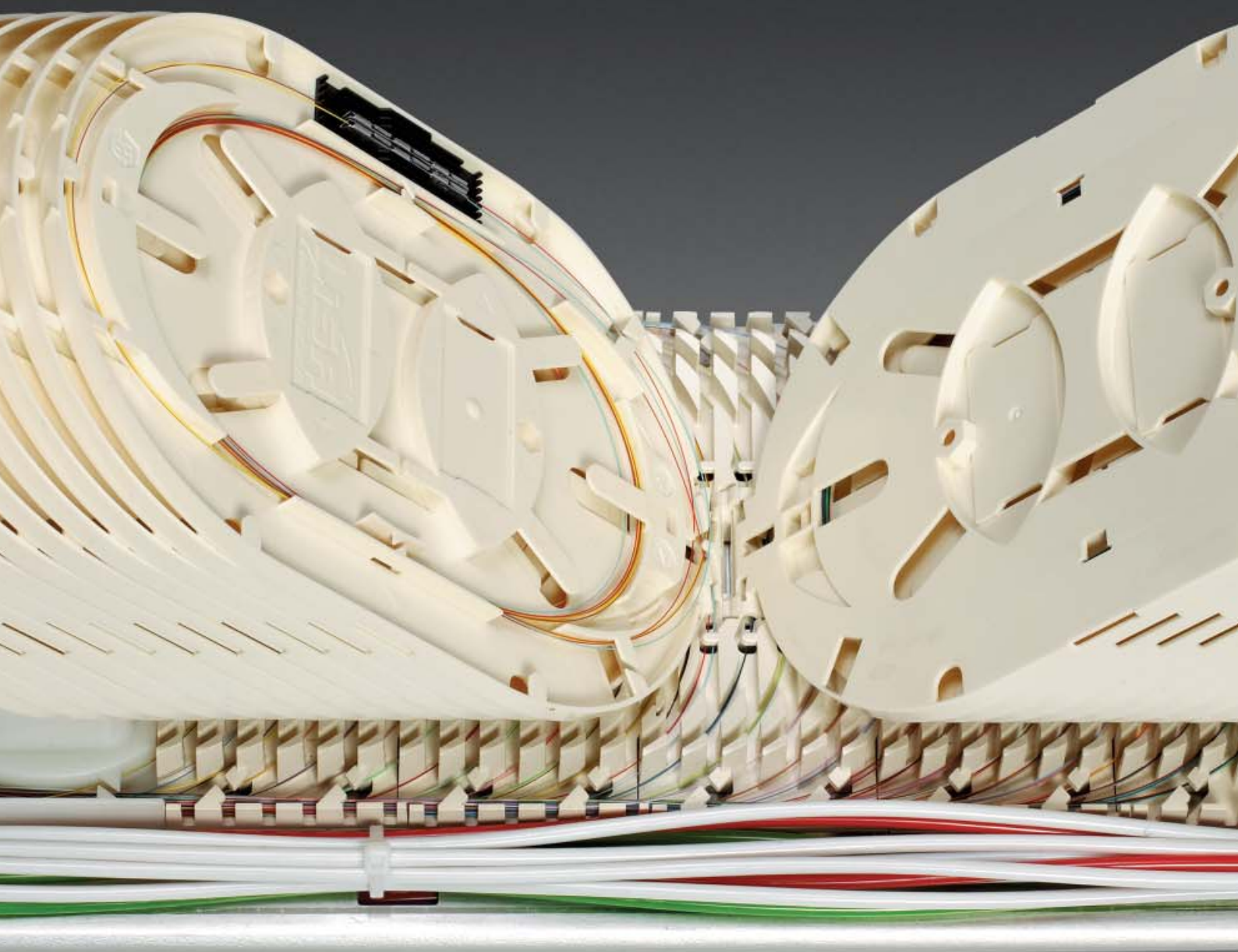
SINGLE PARTS AND TOOLS

Single parts
page 180

Tools
page 183

Single parts and tools

SINGLE PARTS

Set of bend radius limiters	Unit	Item no.
ODRF-SUBR-BEND-8M/4S-A1	8	84002996

Features
- for patchcord guidance
- radius 35 mm
- flexible for removing patchcords
- material HDPE, halogen free
- colour blue (RAL 5005)
- supplied with screws

Mandrel	Unit	Item no.
fixed batch quantity = 200	1	23041027

Features
- for patchcord guidance
- radius 35 mm
- material Noryl, halogen free, flame-retardant (UL94 V-1)
- colour black (RAL 9005)

Conduit fixing clip	Unit	Item no.
ODR-CONDUIT-GLD-4-A1	1	84009730
ODR-CONDUIT-GLD-4-A1 100-P	100	84010105

Features
- maintains service loop to fiber tray
- retrofittable to conduits and tray units
- fast fixing of conduits
- easy fastening of the clip to the tray unit
- used in conjunction with ODR tray units and fiber trays

SINGLE PARTS

Brackets for conduits	Unit	Item no.
fixed batch quantity = 10	1	84003336

Features
- for strain relief of conduits
- holds max. 3 conduits
- material PA, flame-retardant (UL94 V-0)

Bend limitation conduit	Unit	Item no.
fixed batch quantity = 100 m	1 m	84003340

Features
- for bend radius limitation of loose tubes up to Ø 3mm
- material polypropylene, halogen free
- colour white

Bend limitation conduit	Unit	Item no.
ODR-CONDUIT-VO-SLD-5M	5 m	84014504
ODR-CONDUIT-VO-SLD-100M	100 m	84014501

Features
- for bend radius limitation of loose tubes up to Ø 3mm
- easy feeding of loose tubes over a long length
- material PBT, flame-retardant (UL94 V-0)
- colour black

Patchcord retaining ring	Unit	Item no.
ODR-PATCHCORD-BND-3-100P	100	84014506

Features
- grips patchcords to tray unit
- flexible silicon material

Single parts

Single parts and tools

SINGLE PARTS

Velcro strap	Unit	Item no.
INST-ACC-VSTRAP-25	25 m	84005450

Features
- to bind cables and patchcords together
- colour black
- width 16 mm
- delivered on a reel

Velcro tie	Unit	Item no.
INST-ACC-VSTRAP-7X200	100	84005802

Features
- with retaining slot
- colour black
- dimensions (W × L) 7 × 200 mm

Screw kit	Unit	Item no.
ODRF-ACC-0-FIX-M6-A1	50	84003759

Features
- screws with cross recess and washers for mounting of subunits to rails of a rack M6x14
- for ODR 300F, 600F, 900F, 1200F, 800F (19")

1

2

| Laser logo		Unit	Item no.
1	for MCM splice cassette lid fixed batch quantity = 1250 size 25 × 25 mm LASER-LOGO	1	84000027
2	for racks, fixed batch quantity =10 size 50 × 50 mm LRG/LASER-LABEL-A1	1	84005275

Single parts

Single parts and tools

SINGLE PARTS

Central strength member clamp	Unit	Item no.
CSM-CLAMP-A1	10	84010409

Features

- for fixing central strength member
- open apperture eliminates the need to feed the strength member element through the hole
- can be mounted from the underside of a base plate or from top side
- includes grub screw and self-tapping screw for top mounting
- material brass nickel plated
- dimensions Ø 12 × 16 mm (D × H)
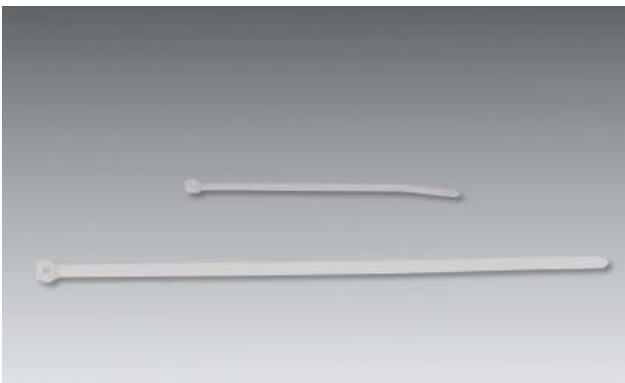
Cable ties	Unit	Item no.
cable ties small (2.5×99 mm), white, fixed batch quantity = 100	1	23218200
cable ties big (5×205 mm), white, fixed batch quantity = 100	1	23236335

TOOLS

Buffer tube stripper	Unit	Item no.
9801.20.C	1	22645747

Features

- to cut loose tubes up to Ø 3 mm and bend limitation conduits for loose tubes up to max. Ø 5 mm
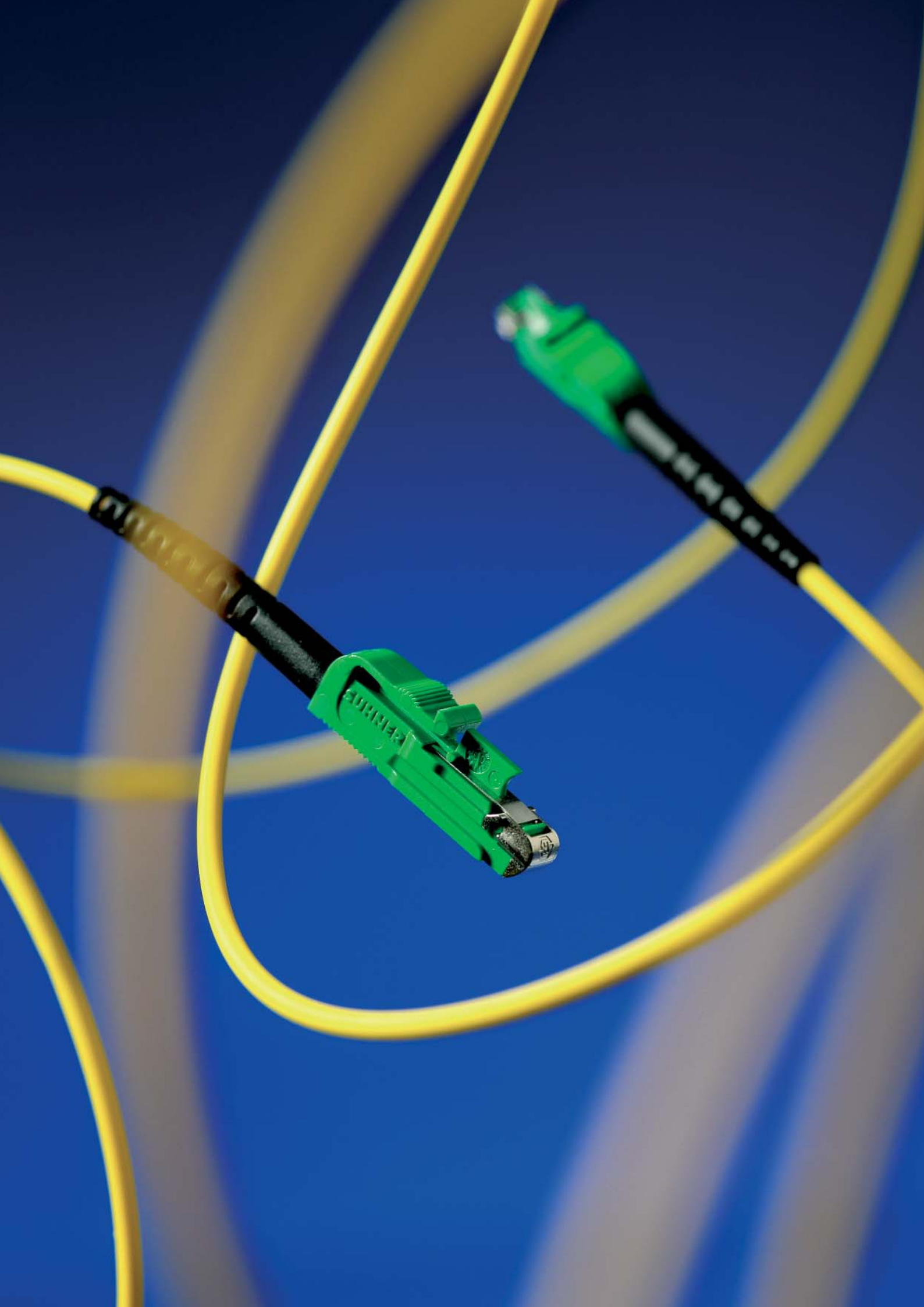
Tools

Single parts and tools

CONNECTIVITY

Connectivity

CONNECTOR OVERVIEW
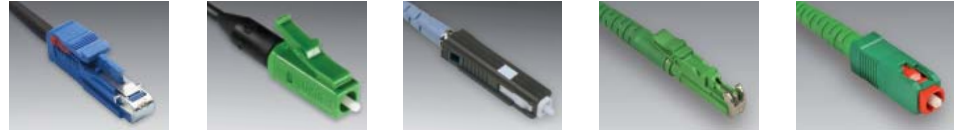
Connector type	LX.5	LC	MU	LSH (E–2000™)	SC
compliance	IEC 61754–23 TIA 604–13	IEC 61754–20 TIA 604–10–A	IEC 61754–6	IEC 61754–15 TIA 604–16	IEC 61754–4 TIA 604–3
Tuning					
in steps	45°	45°	90°	60°	60°
Mech./therm. perform.					
tensile load [N]	100	100	70	100	100
mating durability [cycles]	1000	1000	1000	1000	1000
operating temperature	–40° to +85 °C	–40° to +85 °C	–40° to +85 °C	–40° to +85 °C	–40° to +85 °C
Flammability					
UL 94–V0	•	•	•	•	•
Colour of housing					
SM PC	blue	blue	brown	blue	blue
SM APC	green	green		green	green
MM	beige	beige		beige	beige
brass nickel-plated					
Fiber type					
E9/125	•	•	•	•	•
G50/125/OM3	•	•	•	•	•
G62.5/125	•	•	•	•	•
HCS200/230	–	–	–	•	•
Features					
one piece design	•	•	–	•	•
automatic metal shutter	•	–	–	•	–
SFF connector	•	•	•	–	–
colour coding	•	•	–	•	–
for HighPower applications	•	•	–	•	•
cable diameter [mm]	0.6 up to 2.8	0.6 up to 2.8	0.6 up to 2.0	0.6 up to 3.5	0.6 up to 3.5
Insertion loss [dB]*					
multimode	typ. ≤	0.20	0.20	0.20	0.20	0.20
	97 % ≤	0.50	0.50	0.50	0.50	0.50
SM 0.1dB	typ. ≤	0.06	0.06	n/a	0.06	0.06
	97 % ≤	0.15	0.15	n/a	0.15	0.15
SM High–End	typ. ≤	0.12	0.12	0.12	0.12	0.12
	97 % ≤	0.25	0.25	0.25	0.25	0.25
SM LAN–Eco	typ. ≤	0.25	0.25	0.25	0.25	0.25
	97 % ≤	0.70	0.70	0.70	0.70	0.70
Return loss [dB]					
singlemode	PC >	45	45	45	45	45
	UPC >	50	50	50	50	50
	APC >	85	85	–	85	85

* each-to-each

Further information is available in the Fiber Optic Connectors General Catalogue (Item Nr. 84019828) or online under www.hubersuhner.com

Overview connector types

Connectivity

CONNECTOR OVERVIEW

FCPC	LSA (DIN)	ST–LEAN	ST– HQ	ST–SEC	MT–RJ	FSMA
IEC 61754–13 TIA 604–4–A	IEC 61754–3 DIN 47256	IEC 61754–2 TIA 604–2	IEC 61754–2 TIA 604–2	IEC 61754–2 TIA 604–2	IEC 61754–18 TIA 604–12	
PC infinitely						
APC 60°	60°					
100	100	100	100	100	70	100
1000	1000	1000	1000	1000	500	1000
–40° to +85 °C	–40° to +85 °C	–40° to +85 °C	–40° to +85 °C	–40° to +85 °C	–25° to +70 °C	–40° to +85 °C
					black	
					black	
•	•	• (black nut)	•	•		•
•	•	–	•	•	•	–
•	•	•	•	•	•	•
•	•	•	•	•	•	•
•	–	–	•	–	–	•
•	•	•	•	•	–	•
–	–	–	–	–	–	–
–	–	–	–	–	•	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
0.6 up to 3.5	0.6 up to 3.5	0.6 up to 3.5	0.6 up to 3.5	0.6 up to 3.5	0.6 and 1.7	0.6 up to 4.5
0.20	0.20	0.25	0.20	0.20	0.25	1.00
0.50	0.50	0.70	0.50	0.50	0.70	1.50
0.06	n/a	n/a	n/a	n/a	n/a	n/a
0.15	n/a	n/a	n/a	n/a	n/a	n/a
0.12	0.12	n/a	n/a	n/a	n/a	n/a
0.25	0.25	n/a	n/a	n/a	n/a	n/a
0.25	0.25	n/a	0.25	0.25	0.25	n/a
0.70	0.70	n/a	0.70	0.70	0.70	n/a
45	45	–	45	45	35	–
50	50	–	–	–	–	–
85	85	–	–	–	–	–

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

Overview connector types

Connectivity

PATCHCORDS FOR ODR FRONTACCESS

Product			ODR 300F	ODR 600F	ODR 900F	ODR 1200F
connection			within rack	within rack	within rack	within rack
connector*	fiber type	cable type	ordering code for patchcords			
LX.5	SM	Ø 2.4, simplex	24H01SE0-09-80/80-2-4.5-BB	24H01SE0-09-80/80-2-5-BB	24H01SE0-09-80/80-2-4.5-BB	24H01SE0-09-80/80-2-4.5-BB
LX.5 APC	SM	Ø 2.4, simplex	24H01SE0-09-83/83-2-4.5-BB	24H01SE0-09-83/83-2-5-BB	24H01SE0-09-83/83-2-4.5-BB	24H01SE0-09-83/83-2-4.5-BB
LC	SM	Ø 2.4, simplex	24H01SE0-09-85/85-2-4.5-BB	24H01SE0-09-85/85-2-5-BB	24H01SE0-09-85/85-2-4.5-BB	24H01SE0-09-85/85-2-4.5-BB
LC APC	SM	Ø 2.4, simplex	24H01SE0-09-86/86-2-4.5-BB	24H01SE0-09-86/86-2-5-BB	24H01SE0-09-86/86-2-4.5-BB	24H01SE0-09-86/86-2-4.5-BB
E-2000™	SM	Ø 2.4, simplex	24H01SE0-09-90/90-2-4.5-BB	24H01SE0-09-90/90-2-5-BB	24H01SE0-09-90/90-2-4.5-BB	24H01SE0-09-90/90-2-4.5-BB
E-2000™ APC	SM	Ø 2.4, simplex	24H01SE0-09-93/93-2-4.5-BB	24H01SE0-09-93/93-2-5-BB	24H01SE0-09-93/93-2-4.5-BB	24H01SE0-09-93/93-2-4.5-BB
SC	SM	Ø 2.4, simplex	24H01SE0-09-70/70-2-4.5-BB	24H01SE0-09-70/70-2-5-BB	24H01SE0-09-70/70-2-4.5-BB	24H01SE0-09-70/70-2-4.5-BB
SC APC	SM	Ø 2.4, simplex	24H01SE0-09-73/73-2-4.5-BB	24H01SE0-09-73/73-2-5-BB	24H01SE0-09-73/73-2-4.5-BB	24H01SE0-09-73/73-2-4.5-BB
FCPC	SM	Ø 2.4, simplex	24H01SE0-09-30/30-2-4.5-BB	24H01SE0-09-30/30-2-5-BB	24H01SE0-09-30/30-2-4.5-BB	24H01SE0-09-30/30-2-4.5-BB
FCPC APC	SM	Ø 2.4, simplex	24H01SE0-09-33/33-2-4.5-BB	24H01SE0-09-33/33-2-5-BB	24H01SE0-09-33/33-2-4.5-BB	24H01SE0-09-33/33-2-4.5-BB

* same connector type on both ends, high end quality for singlemode, without colour and mechanical coding

For other patchcord configurations please use the assembly ordering code further in the back of this chapter.

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

Patchcords

Connectivity

PATCHCORDS FOR ODR SIDEACCESS

Product			ODR 600S	ODR 900S	
connection			within rack with cross-connect unit	within one section of a rack	system to line within one rack
connector*	fiber type	cable type	ordering code for patchcords		
LX.5	SM	Ø 1.7, simplex	17H01SE0-09-80/80-2-4-BB	17H01SE0-09-80/80-2-3.5-BB	17H01SE0-09-80/80-2-5-BB
LX.5 duplex	SM	Ø 1.7, duplex	17HD8VEE-09-81/81-2-4-BB	17HD8VEE-09-81/81-2-3.5-BB	17HD8VEE-09-81/81-2-5-BB
LX.5 APC	SM	Ø 1.7, simplex	17H01SE0-09-83/83-2-4-BB	17H01SE0-09-83/83-2-3.5-BB	17H01SE0-09-83/83-2-5-BB
LC	SM	Ø 1.7, simplex	17H01SE0-09-85/85-2-4-BB	17H01SE0-09-85/85-2-3.5-BB	17H01SE0-09-85/85-2-5-BB
LC duplex	SM	Ø 1.7, duplex	17HD8VEE-09-88/88-2-4-BB	17HD8VEE-09-88/88-2-3.5-BB	17HD8VEE-09-88/88-2-5-BB
LC APC	SM	Ø 1.7, simplex	17H01SE0-09-86/86-2-4-BB	17H01SE0-09-86/86-2-3.5-BB	17H01SE0-09-86/86-2-5-BB
E-2000™	SM	Ø 1.7, simplex	17H01SE0-09-90/90-2-4-BB	17H01SE0-09-90/90-2-3.5-BB	17H01SE0-09-90/90-2-5-BB
E-2000™ APC	SM	Ø 1.7, simplex	17H01SE0-09-93/93-2-4-BB	17H01SE0-09-93/93-2-3.5-BB	17H01SE0-09-93/93-2-5-BB
SC	SM	Ø 1.7, simplex	17H01SE0-09-70/70-2-4-BB	17H01SE0-09-70/70-2-3.5-BB	17H01SE0-09-70/70-2-5-BB
SC APC	SM	Ø 1.7, simplex	17H01SE0-09-73/73-2-4-BB	17H01SE0-09-73/73-2-3.5-BB	17H01SE0-09-73/73-2-5-BB
FCPC	SM	Ø 1.7, simplex	17H01SE0-09-30/30-2-4-BB	17H01SE0-09-30/30-2-3.5-BB	17H01SE0-09-30/30-2-5-BB
FCPC APC	SM	Ø 1.7, simplex	17H01SE0-09-33/33-2-4-BB	17H01SE0-09-33/33-2-3.5-BB	17H01SE0-09-33/33-2-5-BB

* same connector type on both ends, high end quality for singlemode, without colour and mechanical coding

For other patchcord configurations please use the assembly ordering code further in the back of this chapter.

patchcords

Connectivity

PATCHCORDS FOR ODR 800F (19")

Product	ODR 800F 19"

connection			within rack
connector*	fiber type	cable type	**ordering code for patchcords**
LX.5	SM	Ø 2.0, simplex	20H01CE0-09-80/80-2-3-BB
LX.5 duplex	SM	Ø 2.0, duplex	20HD8CE0-09-81/81-2-3-BB
LC	SM	Ø 2.0, simplex	20H01CE0-09-85/85-2-3-BB
LC duplex	SM	Ø 2.0, duplex	20HD8CE0-09-88/88-2-3-BB
E-2000™	SM	Ø 2.0, simplex	20H01CE0-09-90/90-2-3-BB
E-2000™	MM 50um	Ø 2.0, duplex	20HD8CD0-50-90/90-4-3-MM
SC	SM	Ø 2.0, simplex	20H01CE0-09-70/70-2-3-BB
SC	MM 50um	Ø 2.0, duplex	20HD8CD0-50-70/70-4-3-MM
SC duplex	MM 50um	Ø 2.0, duplex	20HD8CD0-50-77/77-2-3-MM
FCPC	SM	Ø 2.0, simplex	20H01CE0-09-30/30-2-3-BB

* same connector type on both ends, high end quality for singlemode, without colour and mechanical coding

For other patchcord configurations please use the assembly ordering code further in the back of this chapter.

Patchcords

Connectivity

PATCHCORDS FOR OUTDOOR CABINETS – FRONTACCESS

Product			Uni 8	SiCab 08	SiCab 12
connection			within cabinet	within cabinet	within cabinet
connector*	fiber type	cable type	ordering code for patchcords		
LX.5	SM	Ø 2.4, simplex	24H01SE0-09-80/80-2-2-BB	24H01SE0-09-80/80-2-2-BB	24H01SE0-09-80/80-2-2-BB
LX.5 APC	SM	Ø 2.4, simplex	24H01SE0-09-83/83-2-2-BB	24H01SE0-09-83/83-2-2-BB	24H01SE0-09-83/83-2-2-BB
LC	SM	Ø 2.4, simplex	24H01SE0-09-85/85-2-2-BB	24H01SE0-09-85/85-2-2-BB	24H01SE0-09-85/85-2-2-BB
LC APC	SM	Ø 2.4, simplex	24H01SE0-09-86/86-2-2-BB	24H01SE0-09-86/86-2-2-BB	24H01SE0-09-86/86-2-2-BB
E-2000™	SM	Ø 2.4, simplex	24H01SE0-09-90/90-2-2-BB	24H01SE0-09-90/90-2-2-BB	24H01SE0-09-90/90-2-2-BB
E-2000™ APC	SM	Ø 2.4, simplex	24H01SE0-09-93/93-2-2-BB	24H01SE0-09-93/93-2-2-BB	24H01SE0-09-93/93-2-2-BB
SC	SM	Ø 2.4, simplex	24H01SE0-09-70/70-2-2-BB	24H01SE0-09-70/70-2-2-BB	24H01SE0-09-70/70-2-2-BB
SC APC	SM	Ø 2.4, simplex	24H01SE0-09-73/73-2-2-BB	24H01SE0-09-73/73-2-2-BB	24H01SE0-09-73/73-2-2-BB
FCPC	SM	Ø 2.4, simplex	24H01SE0-09-30/30-2-2-BB	24H01SE0-09-30/30-2-2-BB	24H01SE0-09-30/30-2-2-BB
FCPC APC	SM	Ø 2.4, simplex	24H01SE0-09-33/33-2-2-BB	24H01SE0-09-33/33-2-2-BB	24H01SE0-09-33/33-2-2-BB

* same connector type on both ends, high end quality for singlemode, without colour and mechanical coding

For other patchcord configurations please use the assembly ordering code further in the back of this chapter.

PATCHCORDS FOR OUTDOOR CABINETS – SIDEACCESS

Product			Uni 8	SiCab 08	SiCab 12	
connection			within cabinet	within cabinet	between both bays in a cabinet	within one bay in a cabinet
connector*	fiber type	cable type	ordering code for patchcords			
LX.5	SM	Ø 1.7, simplex	17H01SE0-09-80/80-2-1.5-BB	17H01SE0-09-80/80-2-2-BB	17H01SE0-09-80/80-2-3-BB	17H01SE0-09-80/80-2-2-BB
LX.5 duplex	SM	Ø 1.7, duplex	17HD8VEE-09-81/81-2-1.5-BB	17D8VEE-09-81/81-2-2-BB	17HD8VEE-09-81/81-2-3-BB	17HD8VEE-09-81/81-2-2-BB
LX.5 APC	SM	Ø 1.7, simplex	17H01SE0-09-83/83-2-1.5-BB	17H01SE0-09-83/83-2-2-BB	17H01SE0-09-83/83-2-3-BB	17H01SE0-09-83/83-2-2-BB
LC	SM	Ø 1.7, simplex	17H01SE0-09-85/85-2-1.5-BB	17H01SE0-09-85/85-2-2-BB	17H01SE0-09-85/85-2-3-BB	17H01SE0-09-85/85-2-2-BB
LC duplex	SM	Ø 1.7, duplex	17HD8VEE-09-88/88-2-1.5-BB	17HD8VEE-09-88/88-2-2-BB	17HD8VEE-09-88/88-2-3-BB	17HD8VEE-09-88/88-2-2-BB
LC APC	SM	Ø 1.7, simplex	17H01SE0-09-86/86-2-1.5-BB	17H01SE0-09-86/86-2-2-BB	17H01SE0-09-86/86-2-3-BB	17H01SE0-09-86/86-2-2-BB
E-2000™	SM	Ø 1.7, simplex	17H01SE0-09-90/90-2-1.5-BB	17H01SE0-09-90/90-2-2-BB	17H01SE0-09-90/90-2-3-BB	17H01SE0-09-90/90-2-2-BB
E-2000™ APC	SM	Ø 1.7, simplex	17H01SE0-09-93/93-2-1.5-BB	17H01SE0-09-93/93-2-2-BB	17H01SE0-09-93/93-2-3-BB	17H01SE0-09-93/93-2-2-BB
SC	SM	Ø 1.7, simplex	17H01SE0-09-70/70-2-1.5-BB	17H01SE0-09-70/70-2-2-BB	17H01SE0-09-70/70-2-3-BB	17H01SE0-09-70/70-2-2-BB
SC APC	SM	Ø 1.7, simplex	17H01SE0-09-73/73-2-1.5-BB	17H01SE0-09-73/73-2-2-BB	17H01SE0-09-73/73-2-3-BB	17H01SE0-09-73/73-2-2-BB
FCPC	SM	Ø 1.7, simplex	17H01SE0-09-30/30-2-1.5-BB	17H01SE0-09-30/30-2-2-BB	17H01SE0-09-30/30-2-3-BB	17H01SE0-09-30/30-2-2-BB
FCPC APC	SM	Ø 1.7, simplex	17H01SE0-09-33/33-2-1.5-BB	17H01SE0-09-33/33-2-2-BB	17H01SE0-09-33/33-2-3-BB	17H01SE0-09-33/33-2-2-BB

* same connector type on both ends, high end quality for singlemode, without colour and mechanical coding

For other patchcord configurations please use the assembly ordering code further in the back of this chapter.

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

HUBER+SUHNER FIBER OPTICS

Patchcords

Connectivity

ASSEMBLY: ORDERING CODE

					Description
					cable type
27H01CD0-					see cable code definition on next page
					fiber type
	09-				singlemode 9/125 µm
	LE-				singlemode LEAF NZDS-fiber
	50-				multimode G50/125 µm
	53-				multimode G50/125 µm OM3
	62-				multimode G62.5/125 µm
	P1				PM 1550 with UV/UV 400 µm (standard)
					connector type
		20/			connector left side; connector code please see inside back cover
		20-			connector right side; connector code please see inside back cover
					total number of connectors
			1-		1 connector (pigtail)
			4-		e.g.: duplex patchcord with 4 simplex connectors
					length of assembly
				2.5-	length in meters (ferrule tip to ferrule tip)
					optical performance level
					1st letter = connector left side 2nd letter = connector right side
				K	no connector right side (pigtail)
			A	A	singlemode LAN-Eco
			B	B	singlemode High-End
			C	C	singlemode 0.1 dB
			D	D	singlemode High-End UPC
			E	E	singlemode HighPower
			F	F	singlemode 0.1 dB UPC
			M	M	multimode
					ER performance
			23		extinction ratio 23 dB (standard)

Assemblies: ordering code, classes

Connectivity

CABLE CODE FOR ASSEMBLIES

Fiber type	Cable Ø [mm]	Colour	Ordering code	Cable code	Item no.
			semi-tight tubes		
SM 9µm	0.9	yellow	01-E9/CH-E9-FE	09A01DEE	22521983
MM 50µm	0.9	orange	01-G50/CH-D9-FD	09A01DDD	22520626
MM 62µm	0.9	blue	01-G62/CH-C9-FC	09A01DCC	22520967
			simplex LSFH		
SM 9µm	1.7	yellow	01-E9/SWJH-E17	17H01SE0	22523105
SM 9µm	2.1	yellow	01-E9/SWJH-E21	21H01SE0	23014851
SM 9µm	2.4	yellow	01-E9/SWJH-E24	24H01SE0	23013083
SM 9µm	2.0	yellow	01-E9/CWJH-E20	20H01CE0	84012397
SM 9µm	2.7	yellow	01-E9/CWJH-E27	27H01CE0	22523125
MM 50µm	2.0	orange	01-G50/CWJH-D20	20H01CD0	84000564
MM 50µm	2.7	orange	01-G50/CWJH-D27	27H01CD0	22523126
MM 62µm	2.0	orange	01-G62/CWJH-D20	20H01CD0	84000565
MM 62µm	2.7	orange	01-G62/CWJH-D27	27H01CD0	22523127
			duplex „Figure 8" LSFH		
SM 9µm	1.7 x 3.5	yellow	02-E9/VJH-E17	17HD8VEE	23040758
SM 9µm	2.0 x 4.1	yellow	02-E9/CWJH-E20	20HD8CE0	84008151
SM 9µm	2.7 x 5.5	yellow	02-E9/CWJH-E27	27HD8CE0	22523202
MM 50µm	1.7 x 3.5	orange	02-G50/VJH-D17	17HD8VDD	23040759
MM 50µm	2.0 x 4.1	orange	02-G50/CWJH-D20	20HD8CD0	84008152
MM 50µm	2.7 x 5.5	orange	02-G50/CWJH-D27	27HD8CD0	22523203
MM 50µm - OM3	1.7 x 3.5	aqua	02-G50/VJH-M17-F	17HD8VMM	84005418
MM 50µm - OM3	2.0 x 4.1	aqua	02-G50/CWJH-M20-F	20HD8CM0	84008169
MM 50µm - OM3	2.7 x 5.5	aqua	02-G50/CWJH-M27-F	27HD8CM0	84005133
MM 62µm	1.7 x 3.5	orange	02-G62/VJH-D17	17HD8VDC	23040760
MM 62µm	2.0 x 4.1	orange	02-G62/CWJH-D20	20HD8CD0	84008153
MM 62µm	2.7 x 5.5	orange	02-G62/CWJH-D27	27HD8CD0	22523204
			duplex „Figure 0" LSFH		
SM 9µm	3.1 x 5.2	yellow	02-E9/CWJH-AE20	20HD0CE0	23039888
SM 9µm	3.5 x 6.2	yellow	02-E9/CWJH-AE27	27HD0CE0	22523252
MM 50µm	3.1 x 5.2	orange	02-G50/CWJH-AD20	20HD0CD0	23039889
MM 50µm	3.5 x 6.2	orange	02-G50/CWJH-AD27	27HD0CD0	22523253
MM 50µm - OM3	3.1 x 5.2	aqua	02-G50/CWJH-AM20-F	20HD0CM0	84005553
MM 50µm - OM3	3.5 x 6.2	aqua	02-G50/CWJH-AM27-F	27HD0CM0	84005135
MM 62µm	3.1 x 5.2	orange	02-G62/CWJH-AD20	20HD0CD0	23039891
MM 62µm	3.5 x 6.2	orange	02-G62/CWJH-AD27	27HD0CD0	22523254

Assemblies: ordering code, classes

Connectivity

HUBER+SUHNER FIBER OPTICS

ASSEMBLY CLASSES

HUBER+SUHNER Cable Assemblies stand for PERFORMANCE and RELIABILITY

Features
- available in 3 attenuation classes to meet different customer requirements
- full ceramic ferrules as a base for highest performance and reliability
- optimized products and assembling processes due to HUBER+SUHNER in-house connector and cable development and manufacturing
- outstanding mechanical and thermal strengths exceeding requirements of international standards

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0.1 dB Class

Connector quantity

0.02 0.04 0.06 0.08 0.1 0.12   dB
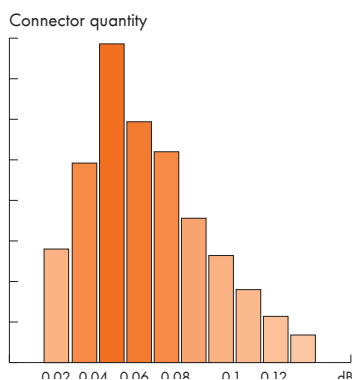
Applications
- long haul transmissions saving costs for signal amplification
- low loss budget transmissions
- transmissions where uniform channel losses are required
- replacement of splices by keeping the same loss level

Compatibility
- all connectors are tuned
- fiber according to ITU-T G.652
- premium ferrule with low eccentricity

Attenuation

	each-to-each		against ref.
IL[1]	IEC 61300-3-34		IEC 61300-3-4
	97%	0.15 dB	max. 0.15 dB
	mean	0.06 dB	
RL	IEC 61300-3-6		
	>45 dB		PC
	>50 dB		UPC
	>85 dB		APC

High-End Class

Connector quantity

0.06   0.10   0.12   0.22   0.30   dB
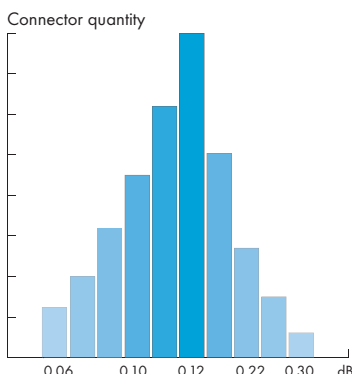
Applications
- CATV / Video
- Passive Optical Networks PON
- WDM /DWDM

Compatibility
- all connectors are tuned
- fiber according to ITU-T G.652

Attenuation

	each-to-each		against ref.
IL[1]	IEC 61300-3-34		IEC 61300-3-4
	97%	0.25 dB	max. 0.35 dB
	mean	0.12 dB	
RL	IEC 61300-3-6		
	>45 dB		PC
	>50 dB		UPC
	>85 dB		APC

1) at 1310 nm

Please note

0.1dB Assemblies have max. losses lower than today's measurement accuracy in the field. Measurement equipment (power meter/OTDR) and measurement set-up, reference cables and adapters, environmental conditions and dirt easily cause measurement uncertainities of
> 0.2 dB. Reliable and reproducible measurements at accuracies below 0.1 dB are feasible under laboratory conditions only.

www.hubersuhner.com/lisa

Assemblies: ordering code, classes

Connectivity

ASSEMBLY CLASSES

Connectivity

LAN-Eco Class

Connector quantity

0.03 0.1 0.18 0.25 0.36 0.5 dB
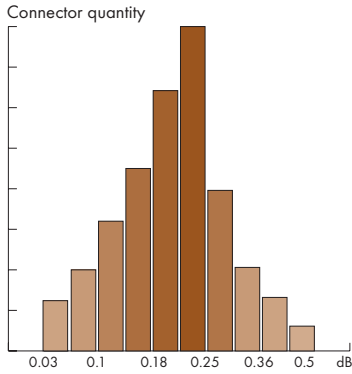
Applications

- universal premises cabling according to EN 50173-1, EIA/TIA 568
- cost effective connections in PON
- FTTD, FTTH, FTTB, FTTX

Compatibility

- connectors are not tuned
- fiber according to ITU-T G.652

Attenuation

	each-to-each		against ref.	
IL[1]	IEC 61300-3-34		IEC 61300-3-4	
	97%	0.70 dB	max.	0.35 dB
	mean	0.25 dB		
RL	IEC 61300-3-6			
	>45 dB		PC	
	>50 dB		UPC	
	>85 dB		APC	

HighPower assemblies

Connector quantity

0.02 0.04 0.06 0.08 0.1 0.12 dB
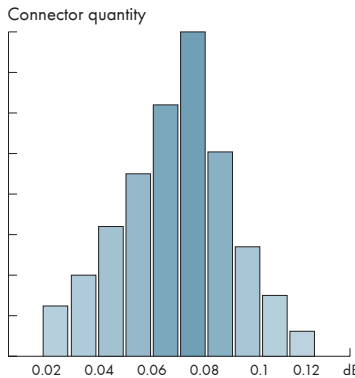
Applications

- DWDM / CWDM
- Raman, EDFA amplifications
- long haul transmissions saving costs for signal amplification

Compatibility

- all connectors are tuned
- fiber according to ITU-T G.652
- premium ferrule with low eccentricity

Attenuation

	each-to-each		against ref.
IL[1]	IEC 61300-3-34		IEC 61300-3-4
	97%	0.15 dB	max. 0.15 dB
	mean	0.06 dB	
RL	IEC 61300-3-6		
	>50 dB		UPC
	>85 dB		APC

1) at 1310 nm

Please note

0.1dB Assemblies have max. losses lower than the accuracy of todays field measurements: Measurement equipment (power meter /OTDR) and measurement set-up, reference cables and adapters, environmental conditions and dirt easily cause measurement uncertainities of >0.2dB. Reliable and reproducible measurements below 0.1dB are possible only in laboratory conditions.

ASSEMBLY CLASSES

The HighPower Concept

HighPower Assemblies are HUBER+SUHNER's answer to the ever-increasing transmission requirements of high-performance networks.

Amplifiers used in DWDM applications can easily reach power levels of one Watt (30dBm). The optical power is concentrated on the fiber core of 10 µm diameter which corresponds to power densities larger than 1.3MW/cm2. Slightest impurities or defects on the fiber end-face can thermally destroy the ferrule.

The HighPower manufacturing process is characterized by stringent cleanness, premium polishing procedures, and special cleaning before packing. HUBER+SUHNER's HighPower assemblies guarantee maximal operational safety with their proven long term performance at average power levels up to 2 W and power peaks up to 5 W.

List of hazard levels (IEC 60825-2) at different power levels in singlemode fibers at 1.3 µm wavelength

Level	Optical power		Hazard
1	15.6 mW	12 dBm	safe under all foreseeable conditions
1M	42.8 mW	16 dBm	safe, but might be hazardous if magnifying instrument is used
3R	80.0 mW	19 dBm	low risk to eyes and to skin
3B	500 mW	27 dBm	medium risk to eyes and low risk to skin
4	> 500 mW		high risk to eyes and skin, even for stray reflected light beams

The high-performance LSH (E-2000™) and LX.5 connectors meet the most stringent handling and functional safety standards. The full metal protection cap guarantees maximum eye safety and no environmental laser hazard under and unplugged and plugged conditions. The special locking and mechanical coding system avoids unintended or unauthorised plugging.

E-2000™ HighPower
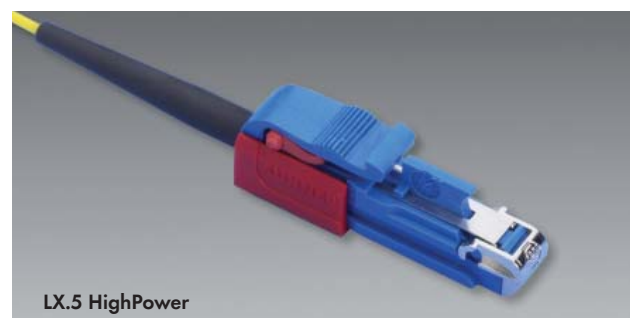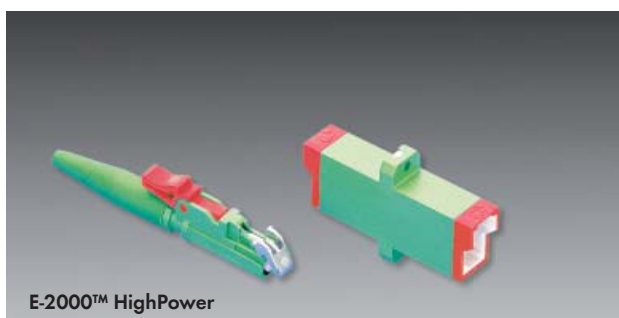
LX.5 HighPower

Upon request FSC-CMAX, FLC and FiberGate HighPower assemblies can be supplied. However these three connectors do not offer the same protection from laser light as they have no shutter.

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone

Assemblies: ordering code, classes

Connectivity

PASSIVE NETWORK COMPONENTS

Features of splitter modules please see page 89
- splitter modules SideAccess please see page 102
- splitter modules FrontAccess please see page 107
- splitter CTB 19" see page 138

WDM
for 1310 and 1550 nm

Features
- low insertion loss
- high stability
- high uniformity

plug type SC

plug type FCPC

Attenuators plug type
available from 1 dB up to 20 dB, in 1 dB steps

Features
- wavelength attenuation stability
- environmental stability
- low back-reflection
- low attenuation tolerances

plug type LC

inline attenuator

Inline attenuators
available from 1 dB up to 30 dB, in 1 dB steps

Features
- low insertion loss
- excellent uniformity
- high stability
- all current SM connectors can be terminated

For detailed information please see our home page www.hubersuhner.com

HUBER+SUHNER FIBER OPTICS

OVERVIEW FIBER TYPES
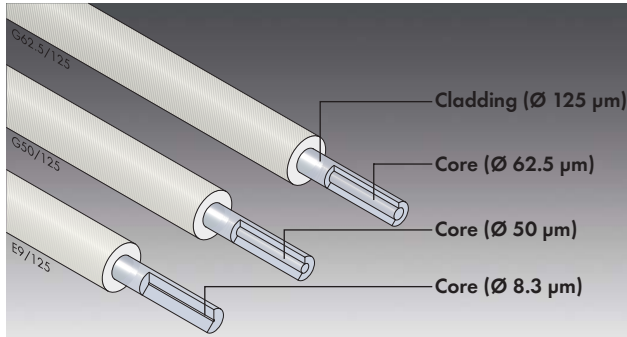
Fiber types
- singlemode 9 µm
- LEAF
- multimode 50 µm (OM2 and OM3)
  and 62.5 µm (OM1 and OM2)

Fiber data for transmission	Fiber E9/125		LEAF fiber		Fiber G50/125		Fiber G62.5/125	
Wavelength [nm]	**1310**	**1550**	**1550**	**1625**	**850**	**1300**	**850**	**1300**
attenuation [dB/km] (typical)	0.35	0.21	0.20	0.22	2.30	0.55	2.7	0.6
attenuation [dB/km] (max.)	0.40	0.25	0.22	0.24	2.50	0.7	3.0	0.8
core Ø [µm]	9.2±0.4[1]	10.4±0.8[1]	9.6±0.4[1]		50±2		62.5±3	
cladding Ø [µm]	125±1		125±0.7		125±2.5		125±2	
coating Ø [µm]	245±10		245±5		245±10		245±10	
standards	• ITU G.652-D • IEC 60793-2-50 type B1.3 • DIN VDE 0888, part 3		• ITU G.655 • IEC 60793-2-50 type B4		• ITU G.651 • IEC 60793-2-10 type A1a + A1a.2 • DIN VDE 0888, part 3		• IEC 60793-2-10 type A1b	

Other fibers on request

Link lengths for standardized fiber types

		Multimode G50/125				Multimode G62.5/125	
fiber class according to HUBER+SUHNER[2]		standard	E	F	G	standard	D
standardized fiber types		OM2	OM2 plus	OM3	OM3 plus	OM1	OM2
min. modal bandwith overfilled launch bandwith [MHz*km]	850 nm	500	600	1500	3500	200	500
	1300 nm	500	1200	500	500	500	500
min. modal bandwith effective laser launch bandwith[3] [MHz*km]	850 nm	n/s	n/s	2000	4700	n/s	n/s
gigabit Ethernet 1000 BASE -SL	850 nm	550 m	750 m	1000 m	1100 m	275 m	550 m
-LX	1300 nm	550 m	2000 m	550 m	550 m	550 m	550 m
10 gigabit Ethernet 10 GBASE -SX	850 nm	–	–	300 m	550 m	– –	– –
-LX4		–	–	300 m	550 m		

According to IEEE 802.3, ISO / IEC 11801-2nd edition   n/s = not standardized

1) Mode field Ø
2) Fiber class allocation for HUBER+SUHNER cable codes
3) Effective laster launch bandwith is assured using DMD as specified in IEC/PA 60793-1-49

Cables

Connectivity

ORDERING INFORMATION FOR INDOOR CABLES

Jellyfree multi-fiber loose tube cables up to 12 fibers
non-armoured with LSFH™-jacket

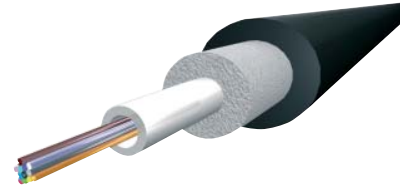| Outer-Ø	Fiber type	Jacket	Type	Item no.	Jacket colour	Fibers
5.0 mm	E9/125	LSFH™	04-4E9/H(ZN)H-E50	84010374	yellow	4
5.0 mm	G50/125	LSFH™	04-4G50/H(ZN)H-D50	22521820	orange	4
5.0 mm	G62.5/125	LSFH™	04-4G62/H(ZN)H-D50	22521821	orange	4
5.0 mm	G50/125	LSFH™	06-6G50/H(ZN)H-D50	22521822	orange	6
5.0 mm	G62.5/125	LSFH™	06-6G62/H(ZN)H-D50	22521823	orange	6
5.0 mm	G50/125	LSFH™	08-8G50/H(ZN)H-D50	22521595	orange	8
5.0 mm	G62.5/125	LSFH™	08-8G62/H(ZN)H-D50	22521596	orange	8
5.0 mm	E9/125	LSFH™	12-12E9/H(ZN)H-B50	84005865	green	12
5.0 mm	E9/125	LSFH™	12-12E9/H(ZN)H-E50	22523600	yellow	12
5.0 mm	G50/125	LSFH™	12-12G50/H(ZN)H-D50	22521597	orange	12
5.0 mm	G62/125	LSFH™	12-12G62/H(ZN)H-D50	22521598	orange	12

Furthermore we deliver other indoor cables such as Simplex, Duplex, Breakout and Riser.

For more detailed information regarding the listed and other cable types please see the Fiber Optic Cables General Catalogue (Item no. 84019826) or our home page www.hubersuhner.com.

ORDERING INFORMATION FOR INDOOR CABLES
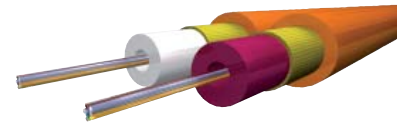
Jellyfree multi-fiber loose tube cables up to 24 fibers
non-armoured with LSFH™-jacket

Fibers	Fiber type	Jacket	Type	Item no.	Jacket colour	Outer-Ø
2 × 12	E9/125	LSFH™	24-12E9/H(ZN)H-E50F	84015522	yellow	5.0 ×10.2 mm
2 × 12	G50/125	LSFH™	24-12G50/H(ZN)H-D50F	–	orange	5.0 ×10.2 mm
2 × 12	G50/125-OM3	LSFH™	24-12G50/H(ZN)H-M50F-F	84013731	turquoise	5.0 ×10.2 mm
2 × 12	G62.5/125	LSFH™	24-12G62/H(ZN)H-D50F	–	orange	5.0 ×10.2 mm
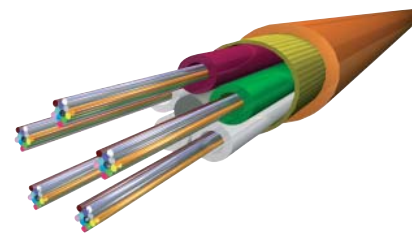
Jellyfree multi-fiber loose tube cables up to 60 fibers
non-armoured with LSFH™-jacket (stranded)

Fibers	Fiber type	Jacket	Type	Item no.	Jacket colour	Outer-Ø
2 × 12	E9/125	LSFH™	24-12E9/HSN(ZN)H-E110	84004279	yellow	11.0 mm
2 × 12	G50/125	LSFH™	24-12G50/HSN(ZN)H-D110	–	orange	11.0 mm
2 × 12	G50/125-OM3	LSFH™	24-12G50/HSN(ZN)H-M110F	–	turquoise	11.0 mm
2 × 12	G62.5/125	LSFH™	24-12G62/HSN(ZN)H-D110	–	orange	11.0 mm
3 × 12	E9/125	LSFH™	36-12E9/HSN(ZN)H-E110	–	yellow	11.0 mm
3 × 12	G50/125	LSFH™	36-12G50/HSN(ZN)H-D110	–	orange	11.0 mm
3 × 12	G50/125-OM3	LSFH™	36-12G50/HSN(ZN)H-M110F	–	turquoise	11.0 mm
3 × 12	G62.5/125	LSFH™	36-12G62/HSN(ZN)H-D110	–	orange	11.0 mm
4 × 12	E9/125	LSFH™	48-12E9/HSN(ZN)H-E110	–	yellow	11.0 mm
4 × 12	G50/125	LSFH™	48-12G50/HSN(ZN)H-D110	–	orange	11.0 mm
4 × 12	G50/125-OM3	LSFH™	48-12G50/HSN(ZN)H-M110F	–	turquoise	11.0 mm
4 × 12	G62.5/125	LSFH™	48-12G62/HSN(ZN)H-D110	–	orange	11.0 mm
5 × 12	E9/125	LSFH™	60-12E9/HSN(ZN)H-E110	–	yellow	11.0 mm
5 × 12	G50/125	LSFH™	60-12G50/HSN(ZN)H-D110	–	orange	11.0 mm
5 × 12	G50/125-OM3	LSFH™	60-12G50/HSN(ZN)H-M110F	–	turquoise	11.0 mm
5 × 12	G62.5/125	LSFH™	60-12G62/HSN(ZN)H-D110	–	orange	11.0 mm

Cables

Connectivity

ORDERING INFORMATION FOR OUTDOOR CABLES

Glass-armoured multi-fiber loose tube up to 12 fibers
with PE-jacket

Fibers	Fiber type	Jacket	Type	Item no.	Jacket colour	Outer-Ø
2	G50/125	PE	02-2G50/W(ZNG)Y-G85	22521811	black	8.5 mm
2	G62.5/125	PE	02-2G62/W(ZNG)Y-G85	22521821	black	8.5 mm
2	H200/230	PE	02-2H200/W(ZNG)Y-G85	22523652	black	8.5 mm
4	E9/125	PE	04-4E9/W(ZNG)Y-G85	22523661	black	8.5 mm
4	G50/125	PE	04-4G50/W(ZNG)Y-G85	22521750	black	8.5 mm
4	G62.5/125	PE	04-4G62/W(ZNG)Y-G85	22521751	black	8.5 mm
4	H200/230	PE	04-4H200/W(ZNG)Y-G85	22523653	black	8.5 mm
6	G50/125	PE	06-6G50/W(ZNG)Y-G85	22521752	black	8.5 mm
6	G62.5/125	PE	06-6G62/W(ZNG)Y-G85	22521753	black	8.5 mm
8	E9/125	PE	08-8E9/W(ZNG)Y-G85	23017688	black	8.5 mm
8	G50/125	PE	08-8G50/W(ZNG)Y-G85	22521754	black	8.5 mm
8	G62.5/125	PE	08-8G62/W(ZNG)Y-G85	22521755	black	8.5 mm
10	G50/125	PE	10-10G50/W(ZNG)Y-G85	22521817	black	8.5 mm
10	G62.5/125	PE	10-10G62/W(ZNG)Y-G85	22521819	black	8.5 mm
12	E9/125	PE	12-12E9/W(ZNG)Y-G85	22521756	black	8.5 mm
12	G50/125	PE	12-12G50/W(ZNG)Y-G85	22521757	black	8.5 mm
12	G50/125-OM3	PE	12-12G50/W(ZNG)Y-G85-F	23027099	black	8.5 mm
12	G62.5/125	PE	12-12G62/W(ZNG)Y-G85	22521758	black	8.5 mm

with LSFH™-jacket

Fibers	Fiber type	Jacket	Type	Item no.	Jacket colour	Outer-Ø
4	G50/125	LSFH™	04-4G50/W(ZNG)H-G85	22523601	black	8.5 mm
4	G62.5/125	LSFH™	04-4G62/W(ZNG)H-G85	22523603	black	8.5 mm
8	G50/125	LSFH™	08-8G50/W(ZNG)H-G85	22523602	black	8.5 mm
8	G62.5/125	LSFH™	08-8G62/W(ZNG)H-G85	22523604	black	8.5 mm
12	E9/125	LSFH™	12-12E9/W(ZNG)H-G85	22523654	black	8.5 mm
12	G50/125	LSFH™	12-12G50/W(ZNG)H-G85	22521943	black	8.5 mm
12	G50/125-OM3	LSFH™	12-12G50/W(ZNG)H-M85-F	84005134	turquoise	8.5 mm
12	G62.5/125	LSFH™	12-12G62/W(ZNG)H-G85	22521884	black	8.5 mm

Cables

Connectivity

ORDERING INFORMATION FOR OUTDOOR CABLES
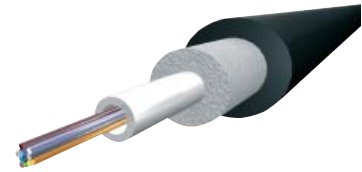
Rugged glass-armoured multi-fiber loose tube up to 12 fibers
with black PE-jacket and two orange stripes

Fibers	Fiber type	Jacket	Type	Item no.	Outer-Ø
12	E9/125	PE	12-12E9/W(ZNG)Y-Z120	22523657	12.0 mm
12	G50/125	PE	12-12G50/W(ZNG)Y-Z120	22523655	12.0 mm
12	G62.5/125	PE	12-12G62/W(ZNG)Y-Z120	22523556	12.0 mm
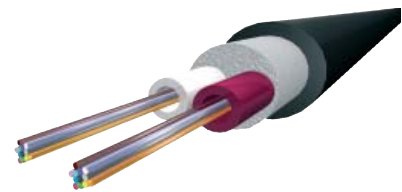
Glass-armoured multi-fiber loose tube up to 24 fibers TWINTUBE
with black PE-jacket

Fibers	Fiber type	Jacket	Type	Item no.	Outer-Ø
2×12	E9/125	PE	24-12E9/W(ZNG)Y-G94	23038137	9.4 × 8.8 mm
2×12	G50/125	PE	24-12G50/W(ZNG)Y-G94	23038138	9.4 × 8.8 mm
2×12	G50/125-OM3	PE	24-12G50/W(ZNG)Y-G94-F	23041030	9.4 × 8.8 mm
2×12	G62.5/125	PE	24-12G62/W(ZNG)Y-G94	23041031	9.4 × 8.8 mm

with LSFH™-jacket

Fibers	Fiber type	Jacket	Type	Item no.	Jacket colour	Outer-Ø
2×12	E9/125	LSFH™	24-12E9/W(ZNG)H-G94	23041032	black	9.4 × 8.8 mm
2×12	G50/125	LSFH™	24-12G50/W(ZNG)H-G94	23038139	black	9.4 × 8.8 mm
2×12	G50/125-OM3	LSFH™	24-12G50/W(ZNG)H-M94-F	84003522	turquoise	9.4 × 8.8 mm
2×12	G62.5/125	LSFH™	24-12G62/W(ZNG)H-G94	23041033	black	9.4 × 8.8 mm

Cables

Connectivity

ORDERING INFORMATION FOR OUTDOOR CABLES
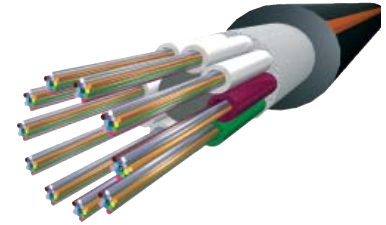
Glass-armloured multi-fiber loose tube up to 144 fibers
with black PE-jacket and two orange stripes (stranded)

Fibers	Fiber type	Jacket	Type	Item no.	Outer-Ø
2×12	E9/125	PE	24-12E9/WSN(ZNG)Y-Z150	22523758	15.0 mm
2×12	G50/125	PE	24-12G50/WSN(ZNG)Y-Z150	22521815	15.0 mm
2×12	G62.5/125	PE	24-12G62/WSN(ZNG)Y-Z150	22521816	15.0 mm
4×12	E9/125	PE	48-12E9/WSN(ZNG)Y-Z150	22523759	15.0 mm
4×12	G50/125	PE	48-12G50/WSN(ZNG)Y-Z150	22523761	15.0 mm
4×12	G62.5/125	PE	48-12G62/WSN(ZNG)Y-Z150	22523762	15.0 mm
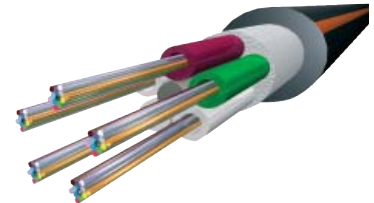
Glass-armoured multi-fiber loose tube up to 60 fibers
with LSFH™-jacket (stranded)

Fibers	Fiber type	Jacket	Type	Item no.	Outer-Ø
2×12	E9/125	LSFH™	24-12E9/WSN(ZNG)H-G116	84012363	11.6 mm
2×12	G50/125	LSFH™	24-12G50/WSN(ZNG)H-G116	84012364	11.6 mm
2×12	G62.5/125	LSFH™	24-12G62/WSN(ZNG)H-G116	84012365	11.6 mm
4×12	E9/125	LSFH™	48-12E9/WSN(ZNG)H-G116	84012387	11.6 mm
4×12	G50/125	LSFH™	48-12G50/WSN(ZNG)H-G116	84012366	11.6 mm
4×12	G50/125-OM3	LSFH™	48-12G50/WSN(ZNG)H-G116-F	84010303	11.6 mm
4×12	G62.5/125	LSFH™	48-12G62/WSN(ZNG)H-G116	84012367	11.6 mm

Cables

Connectivity

MASTERLINE CABLING SYSTEM

MASTERLINE is a preterminated fiber optic cabling that enables to connect distribution points throughout the network structure as:
- racks in central offices to nearby racks
- racks in central offices to other central offices
- from premises to building distributor
- from building to floor distributor (e.g. wall box)

Application areas
- for indoor and outdoor installations
- for Telecom and Datacom (LAN)

General Features
- ready to use cabling system
- easy and time-saving installation
- no need for splicing or connector assembling
- high fiber count links
- cable on special environment-friendly reel for efficient installation
- 100% factory measured with test results for each system

Types
- MASTERLINE classic   – with rugged and waterproof pulling tube
- MASTERLINE compact   – with slim divider only for indoor use
- MASTERLINE lite   – with pulling tube only for indoor use

Applications and characteristics of the types see next pages.

Variants
- connectors on ONE end
- connectors on BOTH ends
- connection boxes on one or both ends (MASTERLINE classic only)

MASTERLINE CLASSIC

side A

side B
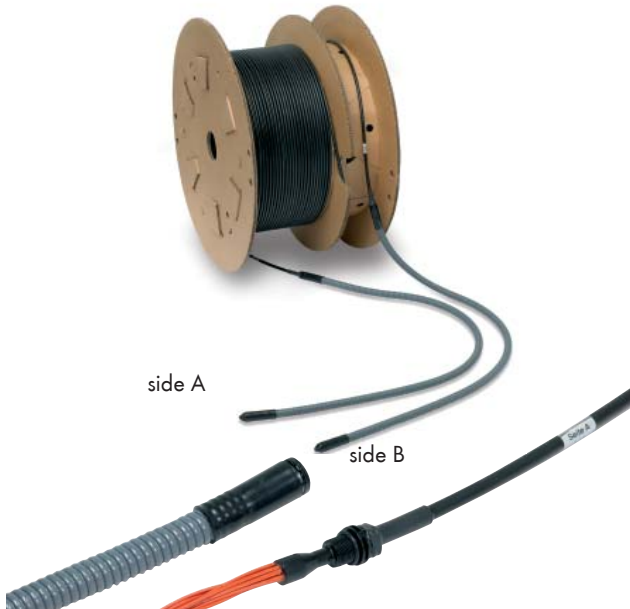
For demanding applications indoors and outdoors.

Features

- 2 − 48 fibers (SM and MM)
- rugged divider with thread and slot for easy mounting
- good mechanical and thermal features
- different multi-fiber loose tube cable types available
- all standard connector types can be assembled
- watertight and rugged steel/plastic pulling tube (IP 67) protecting connectors
- retrofittable pulling tube for re-installation
- can be pulled directly into tubes and ducting
- pre-terminated on one or both sides (optional with connection box)

Specifications MASTERLINE classic			
number of fibers	up to 12	up to 24	up to 48
divider and pulling tube diameter	22 mm	31 mm	45 mm
max. tensile force [1]	1000 N	1000 N	1200 N
temperature [2] during installation in operation in storage	− 10 °C up to 50 °C − 25 °C up to 70 °C − 25 °C up to 70 °C		
single fiber	Ø 2.1 mm, number coded		
pigtail length standard [3]	1250 mm staggered		
max. cable length [4]	4000 m		

1) Tensile force on the whole cabling system including pulling tube. Tensile force on cable jacket, please see corresponding data sheet
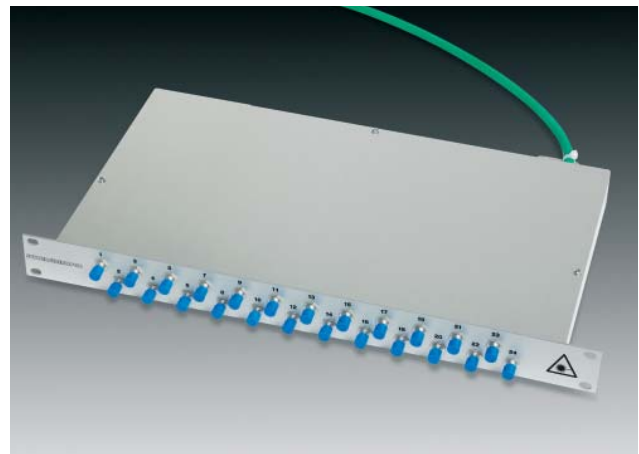2) Temperature range depends on cable type used
3) 1250 mm = longest pigtail. Without staggered pigtails pulling tube cannot be mounted. Bigger pulling tube with divider possible on request
4) Longer cable length possible on request
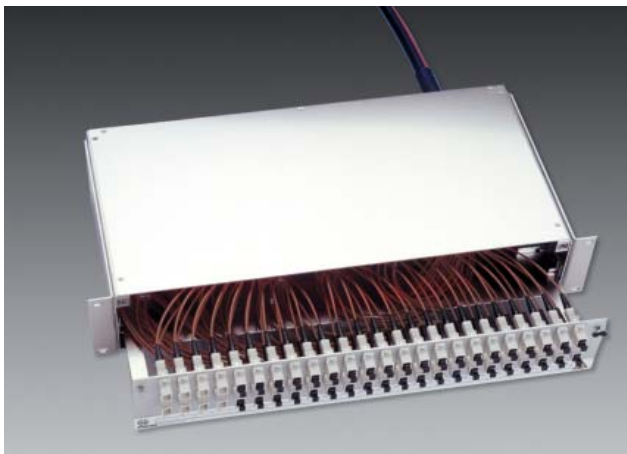
Application: MASTERLINE CTB for ODR

Application: Wall box

HUBER+SUHNER FIBER OPTICS

Cabling systems

Connectivity

MASTERLINE COMPACT

side A   side B
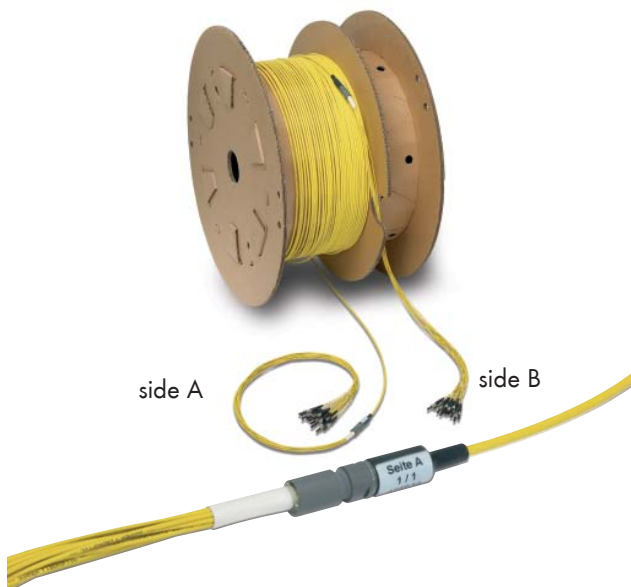
Compact and robust for indoor applications which require a high density in a limited space.

Features

- 2 – 12 fibers (SM and MM)
- very slim divider, only 15 mm diameter
- good mechanical and thermal features
- different cable types available
- all standard connector types can be assembled
- pre-terminated on one or both sides
- no pulling tube

Specifications MASTERLINE compact	
number of fibers	up to 12
divider diameter	15 mm
max. tensile force [1]	800 N
temperature [2] during installation in operation in storage	–10°C up to 50°C –25°C up to 70°C –25°C up to 70°C
single fiber	Ø 2.1 mm, number coded
pigtail length standard	1000 mm
max. cable length [3]	2000 m

1) Tensile force on the whole cabling system. Tensile force on cable jacket, please see corresponding data sheet
2) Temperature range depends on cable type used
3) Longer cable length possible on request

Application: ODR with breakout termination unit

Application: wall box, example with MASTERLINE classic

Cabling systems

Connectivity

MASTERLINE LITE

side A   side B
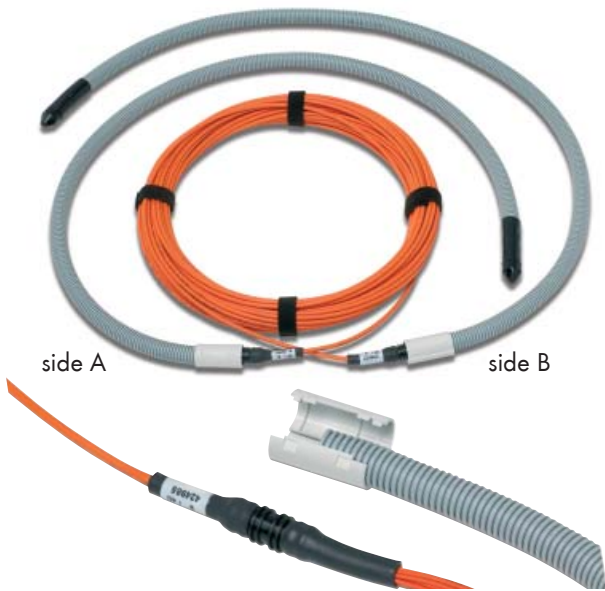
Easy and fast installation mainly for indoor applications.

Features
- 2 – 24 fibers (SM and MM)
- economical, light cabling system
- different multi-fiber loose tube cable types available
- all standard connector types can be assembled
- can be pulled directly into tubes and ducting
- pre-terminated on one or both sides
- pulling tube provides mechanical protection

Specifications MASTERLINE lite		
number of fibers	up to 12	up to 24
divider / max. system diameter	18 / 26 mm	25 / 30 mm
max. tensile force [1]	500 N	700 N
temperature [2] during installation	–5°C up to 50°C	
in operation	–15°C up to 70°C	
in storage	–20°C up to 70°C	
single fiber	Ø 2.1 mm, numbered coded	
pigtail length standard [3]	1250 mm staggered (max. 5000 mm)	
max. cable length [4]	2000 m	

1) Tensile force on the whole cabling system including pulling tube. Tensile force on cable jacket, please see corresponding data sheet

2) Standard at 1300 nm; Singlemode at 1550 nm in operation – 5°C up to + 60°C

3) 1250 mm = longest pigtail. Without staggered pigtails pulling tube cannot be mounted

4) Longer cable length possible on request
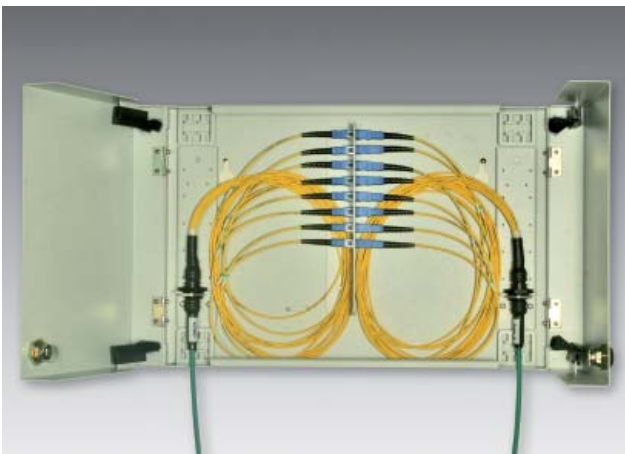
Application: wall box

Application: unpopulated CTB for ODR

Cabling systems

Connectivity

ORDERING CODE MASTERLINE

			Description		
			Variant	side A	side B
1			100		
2			200 [1]		
5			500		
6			600 [1]		
	1		**Fiber type**	singlemode 9/125 µm	
	3			multimode G50/125 µm - OM3	
	5			multimode G50/125 µm	
	6			multimode G62.5/125 µm	
			Number of fibers max. 48		
	nn-		always two figures (eg. 4 fibers = 04)		
			Cable type		
		1	PE-jacket, glass-armoured	≤ 12 fibers ...(ZNG)Y-G...	
				≥ 12 fibers ...SN(ZNG)Y-Z...	
		2	LSFH® jacket, glass-armoured	≤ 12 fibers ...(ZNG)H-G...	
				≥ 12 fibers ...SN(ZNG)H-...	
		3	acc. to customers' requirements		
		4	LSFH® jacket, non-armoured, jellyfree	≤ 12 fibers ...H(ZN)H-...	
		5	LSFH® jacket, glass-armoured, jellyfree	≤ 24 fibers ...H(ZNG)H-...	
		6	PE Twintube, glass-armoured	≤ 24 fibers ...W(ZNG)Y-...	
		7	LSFH® Twintube, glass-armoured	≤ 24 fibers ...W(ZNG)H-...	
			Connector side A for all MASTERLINE types		
	20-		for connector code please see inside back cover		
			Connector side B for MASTERLINE 100/200/600		
	20-		for connector code please see inside back cover		
			Cable length in meters, max. 2000 m		
	0150-		always four figures (eg. 150 m = 0150)		
		A-	**MASTERLINE type**	Classic	
		C-	**MASTERLINE type**	Compact	
		L-	**MASTERLINE type**	Lite	
			Front panels at connection box side A [1] [2]		
	12M-		see MASTERLINE CTB on page 150		
			Front panels at connection box side B [1] [3]		
	12M-		see MASTERLINE CTB on page 150		
			Optical performance 1st letter side A, 2nd letter side B		
		A	LAN-ECO		
		B	High-End	(standard for singlemode)	
		D	UPC		
		M	multimode		
		K	no connector		
1 5 24- 1– 20- 20- 0150- A– - -BB			example MASTERLINE classic, variant 100		

1) variant for MASTERLINE classic only   2) for variant 200 only   3) for variant 200 and 600 only
Connectors and/or front plates not used are left out and marked with a space

Cabling systems

Connectivity

SMARTLINE CABLING SYSTEM
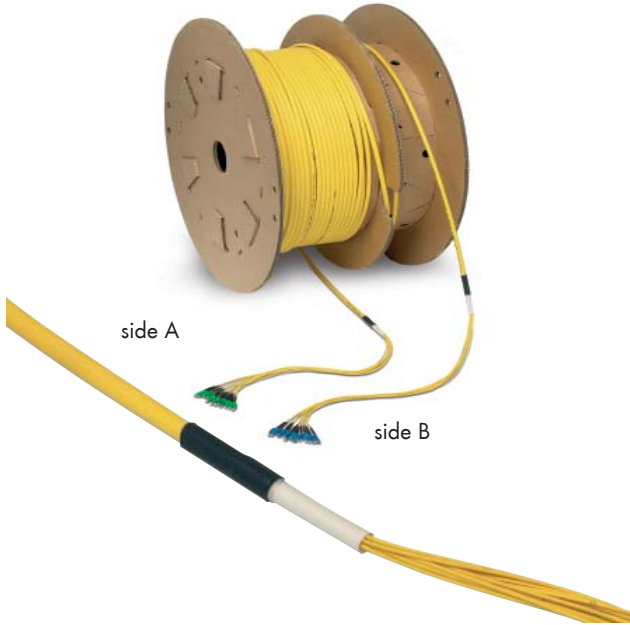
Pre-terminated breakout cable for high density and time saving point-to-point patching.

Features

- 2 — 16 fibers (SM, MM and HCS)
- without divider, with protected breakout
- application of breakout cable types with strain relieved single fibers
- dimensions of single fiber 2.0 or 2.7 mm
- customer specific length for each individual fiber
- all standard connector types can be assembled
- pre-terminated on one or both sides
- no pulling tube
- much easier to handle as a bundle of single patchcords
- for indoor applications

side A

side B

Specifications SMARTLINE breakout	
number of fibers	up to 16
diameter	cable diameter plus 2.0 mm
temperature [1] during installation in operation in storage	– 10 °C up to 50 °C –25 °C up to 70 °C –25 °C up to 70 °C
single fiber	Ø 2.0 mm, 2.7 mm, number coded
pigtail length	100 cm for LISA products or other requirements
max. cable length [2]	2000 m

1) Temperature range depends on cable type used
2) Longer cable length possible on request

SMARTLINE cabling system also available with Riser cable
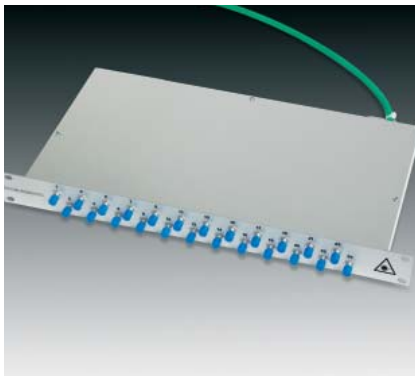
Application: unpopulated CTB for ODR

Application: ODR with breakout termination unit

Application: wall box

HUBER+SUHNER FIBER OPTICS

Cabling systems

Connectivity

ORDERING CODE SMARTLINE

									Description
SB-									SMARTLINE breakout
									Fiber type
	1-								singlemode	9 µm
	3-								multimode	50 µm OM3
	5-								multimode	50 µm
	6-								multimode	62.5 µm
									Number of fibers
		12-							always two figures (eg. 8 fibers = 08), max. 16 fibers
									Cable type
			2-						Breakout cable LSFH® 2.0 mm
			3-						Breakout cable LSFH® 2.7 mm
									Connector side 1 / side 2
				30/30					for connector code please see inside back cover
									pigtail length side 1 / side 2 in cm all tubes with the same length
					150/150				always three figures (eg. 150 cm = 150)
									Cable length between breakouts in m
						0075			always four figures (eg. 75 m = 0075)
									Optical performance side 1 / side 2
							A		ECO
							B		High-End (standard SM)
							C		0.1 dB
							D		0.1 dB UPC
							F		High-End UPC
							M		multimode
SB-	5-	12-	2-	30/30-	150/150-	0075	BB		example

QUICK ASSEMBLY™ – QXA FIELD TERMINATION SYSTEM

The field termination revolution
HUBER+SUHNER's QXA process offers you the quickest way to provide a reliable fiber optic field termination while keeping maximum mobility and flexibility.

Features
- spliceless termination for long term reliable performance
- quick termination process in 90 seconds, no set-up time
- termination with "just two hands", even in unfriendly working conditions
- termination of 0.9 mm tubes and ruggedized cables
- reliability and durability equal to factory termination
- termination processes adapted to all fiber types and performance levels, including angled physical contact (APC)
- all-in-one Multifunction Tool
- easy-to-carry Tool Box for maximum mobility
- enhanced connector design for easy termination

Applications
- fiber to the Desk / Fiber to the Office installations
- fiber to the Home installations
- CATV Networks
- repair and maintenance of all kind networks
- temporary joints in mobile point to point connections
- joints inside industrial connectors

Technical specifications

QXA connectors	Connector type				
	ST MM	**ST SM-PC**	**SC MM**	**SC SM-PC**	**SC SM-APC**
ferrule type	pre-radius	pre-radius	pre-radius	pre-radius	pre-angle
fiber type	G50/125	E9/125	G50/125	E9/125	E9/125
	G62.5/125		G62.5/125		
attenuation mean value	0.3 dB	0.3 dB	0.3 dB	0.3 dB	0.3 dB
attenuation 97 percentile	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB
minimum return loss	20 dB	26 dB	20 dB	26 dB	60 dB
connector interface	IEC 61754-2/TIA 604-2		IEC 61754-4/TIA 604-3		
attenuation measurement	IEC 61300-3-4				
ferrule material	full zirconia				
environmental category	IEC 61753 category C – controlled environment				
wiring applications	EN50173 A – D, ESA/TIA568A				
maximum optical power	150 mW				
maximum cable diameter	2.8 mm				
cable strain relief	70 N				
service temperature	- 25° C to 70° C, depending on cable service temperature				
minimum mating durability	1000 cycles				
flammability	all materials comply with UL 94 V-0				

Further information are available in the Fiber Optic Connectors General Catalogue (Item no. 84019828) or on our homepage under www.hubersuhner.com

TEST AND MEASUREMENT
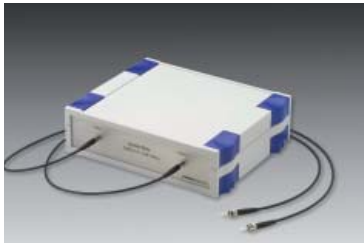
Measurement Fiber Box
Accessories for OTDR or Attenuation (launch/tail fiber) test equipment.
- possible fiber types: 9 μm, Singlemode LEAF, 50 μm, 62.5 μm or 200 μm other fiber types on request
- standard lengths: 100, 200, 500, 1000 and 2000 m, other lengths available (max. 4000 m per height unit or max. 1000 m for H200 fiber)
- connectors: LC, LX.5, ST, LSA, FCPC, SC-CMAX, E-2000™, FSMA

Fiber Optic Inspection Set
includes the necessary tools and material to perform a professional expertise and cleaning of fiber optic connectors in the field. The application range includes the operation as well as the maintenance of fiber optic networks. The components allow to use the fiber optic inspection set for multimode and singlemode applications.
Part no. 24300789.

Fiber Check Tool
With the help of the fiber check tool, a light control can be performed at the fiber and breaking or stress points recognized. Operation modes are CW mode and contiuous dash at visual light (635 nm).
For standard connectors   9801.86.A, part no. 23032064
For SFF connectors   9801.86.B, part no. 23032065

For more information please see the Fiber Optic Connectors General Catalogue (Item no. 84019828) or www.hubersuhner.com.

GLOSSARY

ADSL	Asymmetric Digital Subscriber Line – at the moment the most commonly used communication technique for digital broadband transmission of Internet contents for end-users
Access Network	Sub network for customer access to a carrier network, up to 20 km (12 miles)
Access Node	Network point for the access transfer – usually built as central office including ODR's
CCTV	Closed Circuit Television – describes a video surveillance system in industrial applications
CTB	Cable Termination Box
CWDM	Coarse Wavelength Division Multiplexing - Various wavelengths are sent through the fiber at the same time. CWDM does not require the same network complexity as DWDM. CWDM is a cost-effective solution for metropolitan area and access networks. According to ITU proposal up to 18 channels can be used in the wavelength range from 1270 to 1610 nm.
DIN	German Institute of Standardization
DSL, DSLx	Digtital Subcriber Line – describes different techniques for transmitting data over two or four copper wires of the phone line, so called network termination, with high speed.
DSLAM	Digtital Subcriber Line Access Multiplexer – part of required infrastructure for operation of DSL. DSLAM's are located at a place where all the lines of network terminations are connected
DWDM	Dense Wavelength Division Multiplexing – WDM using a lot of different wavelength in a wavelength range with a small channel spacing. Commercial DWDM systems put 32 wavelength through one fiber, which corresponds, at a rate of 10 Giagabits/s per signal to a total rate of 320 Gigabits/s.
EFM	Ethernet in the First Mile – using the Ethernet protocol in the access network. The working group for EFM (standard IEEE 802.3ah) wants to replace ATM from the access network.
EN	European Standard
Ethernet	Ethernet for data transmission of 10Mb/s. It is the most widely-used data protocol for premises networks.
FT	Fiber Tray – a splice or distribution cassette with telescopic and hinged functionality holding fibers, splice connections and/or adapters. The FT has lateral fiber access to adapters called Side Access.
FTTB	Fiber-To-The-Building - network access with optical fibers to the building
FTTC	Fiber-To-The-Curb – network access with optical fibers to the curb
FTTD	Fiber-To-The-Desk – structured building cabling system (LAN) using optical fibers up to the workplace
FTTH	Fiber-To-The-Home – network access with optical fibers to the home
FTTO	Fiber-To-The-Office – structured building cabling system (LAN) using optical fibers up to the office
FTTP	Fiber-To-The-Premises – network access with optical fibers to the premises
FrontAccess	Access to fibers and adapters from the front of the rack, where usually a door is located
HDTV	High Definition TeleVision – television with high resolution (16:9), 1920 x 1080 pixels
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. www.ieee.org
IP	Internet Protocol
ITU	International Telecommunication Union
LAN	Local Area Network – for the transmission of information between independent terminal units
LISA	Leading Interconnect Systems Approach - HUBER+SUHNER is using this term for passive optical network solutions with different application specifications
LSFH®	Low smoke and free of halogen are characteristics of material behaviour. LSFH® is a Trademark of HUBER+SUHNER AG. Usually these materials are flame retardant and self-extinguishing, they are made of polyethylene and metalhydroxide additives. Similar abbreviations are LSOH and LSZH.
M3K	Pre-terminated and factory tested assembly with maximum 12 fibers including usually a fiber tray at one end and a MASTERLINE manifold at the other
M3KP	A hybrid of the M3K allowing for 24 x 250 μm fibers to be terminated in a single fiber tray

Glossary

GLOSSARY

MAN	Metropolitan Area Network – Inter-regional network for the transmission of information
MCM	MultiCircuit Management – MCM splice cassettes incorporate a bend radius limitation of 35 mm, for DWDM applications for example, allowing for secure storage of spliced fibers up to 24 splice connections
ML	MASTERLINE – A pre-terminated, factory tested and ready-to-use cabling system with 2 to 48 fibers, any connector type including SFF and specified length
OAN	Optical Access Network – access network using optical fibers
ODR	Optical Distribution Rack – interconnects incoming and outgoing optical fibers in a controlled way. Each fiber can be connected to every other fiber within the rack by simple patching
ODU	Optimised Distribution Unit – Subrack that can be front mounted to any standard 19" rack
OLT	Optical Line Termination
ONT	Optical Network Termination – network termination with fiber optics
ONU	Optical Network Unit – transfer point from the carrier to the premises network, also called Network Termination
NT	Network Termination – network termination with fiber or copper technique
Patchcord	Cable assembly with connectors on both ends
PIGCP	A gland with a boot for ruggedised pigtails that can be incorporated into pre-connectorized fiber trays for low-loss terminations
Pigtail	Cable assembly with connector on one end; typically cable Ø 0.9 mm
PON	Passive Optical Network – an all optical network architecture without electrical/optical conversion and vice versa
POTS	Plain Old Telephone Service – common connection in the conventional telephone network
Primary coating	First buffer around the fiber protecting the fiber against humidity and mechanical stress; typically 250 µm
Ruggedised pigtail	Pigtail with reinforced cable than contains usually aramide yarns beneath the outer seath
SCM	The SingleCircuit Management system secures and separates handling of all fibers and fiber pairs for higher reliability and handling requirements. Access to the fibers is possible by folding away of neighbouring cassettes, all previously spliced fibers remain undisturbed.
Secondary coating	Second buffer around the fiber; typically 600 or 900 µm
SideAccess	Access to fibers and adapters laterally of the rack, usually facing a side wall
SFF	Small-Form-Factor connector with usually Ø 1.25 mm ferrule, the small size allows to have a bigger packing density within a given space. Available types: LX.5, LC, MU etc.
Splice	Permanent joint between 2 optical fibers ruptured in a plane, created by fusion, clamping or gluing
1SU	One width unit for modules vertically mounted to subracks 5.08 mm
TCP	Transport Control Protocol
Triple Play	includes telephony, internet and television
1U/1HU	One height unit for subracks mounted to equipment racks 44.45 mm
UL94	is defined as a material test from Underwriters Laboratories Inc, (www.ul.com) testing inflammable material in regards to the fiber behaviour. Therefore after exposing a test rot to fire for 60 seconds the self-extinguishing behaviour is analyzed. V describes the test with a vertical test rod, whereas H is with a horizontally fixed rod. The behaviour of the vertical test is classified into 0, 1 or 2 with 0 showing the best self-extinguishing behaviour.
USC	Universal Splice Closure – accommodates splice connection in MultiCircuit or SingleCircuit Management and is suitable for outside plant applications

GLOSSARY

VDSL	Very High Speed Digital Subscriber Line – VSDL is the fastest of all DSL technologies. It allows a data transmission up to 52 Mbit/s over a phone line, though the usable transmission bandwidth declines with the length of the line. For the maximal speed the length may not exceed 300 m; with 900 m it reduces to half and with 1.4 km to a fourth. The speed of the data transmission enables to offer Triple Play via VDSL including television channels, internet and voice traffic. Planned application of VDSL is the transmission of HDTV, whereas also several channels can be transmitted simultaneously.
VDSL2	The successor standard VDSL2 offers a data rate upt to 100 Mbit/s. For that speed the range of 350 m is aimed at, however excellent phone lines and the absence of open line ends are required.
VoIP	Voice over IP – uses the internet to transport the voice
WAN	Wide Area Network – World-spanning network for the transmission of information (long-haul)
WDM	Wavelength Division Multiplexing – WDM using a lot of different wavelength in a wavelength range with a small channel spacing and transmitted through the same fiber simultaneously
XC	Cross-Connect – point where incoming and outgoing fibers are connected accordingly

Glossary

INDEX

INDEX

ORDERING CODE FOR ADAPTERS AND CONNECTORS

This code is used to order assemblies, fiber trays, wall boxes, breakout termination units, populated CTB's, M3K/M3KP, MASTERLINE and SMARTLINE.

Connector code		Performance level						
x = upon request		A	B	C	D	E	F	M
00	no connector							
20	ST-HQ	•						•
22	ST-Security	•						•
24	ST-LEAN							•
30	FCPC	•	•	•	•		•	•
33	FCPC APC wide key		•	•				
34	FCPC APC small key		•	•				
50	MT-RJ without pins	•						•
51	MT-RJ with pins	•						•
70	SC	•	•	•	•	•	•	•
73	SC APC 8°		•	•		•		
74	SC APC 9°		•	•		•		
77	SC duplex	•	•		•			•

Connector code		Performance level						
x = upon request		A	B	C	D	E	F	M
78	SC APC duplex		•					
80	LX.5		•	•	•	•	•	•
81	LX.5 duplex		•	•	•	•	•	•
83	LX.5 APC		•	•		•		
84	LX.5 APC duplex		•	•		•		
85	LC		•	•	•	x	•	•
86	LC APC		•	•		x		
88	LC duplex		•	•	•	x	•	•
89	LC APC duplex		•	•		x		
90	LSH (E-2000™)	•	•	•	•	•	•	•
93	LSH (E-2000™) APC		•	•	•	•		
97	LSH (E-2000™) duplex	•	•	•	•	•	•	•

COLOUR CODE

Colour code for fibers
according to standard

Number	Swisscom[1]	DIN[2]	ISO	IEC[3]
1	red	red	blue	blue
2	green	green	orange	yellow
3	yellow	blue	green	red
4	blue	yellow	red	natural/white
5	natural/white	natural/white	grey	green
6	violet	grey	yellow	violet
7	orange	brown	brown	orange
8	black	violet	violet	grey
9	grey	turquoise	natural/white	turquoise
10	brown	black	black	black
11	pink	orange	pink	brown
12	turquoise	pink	turquoise	pink

1 standard, unless otherwise specified
2 DIN VDE 0888 part 3
3 IEC 60794-2

Manufacturing of E-2000™-connectors under licence of DIAMOND SA, CH-Losone
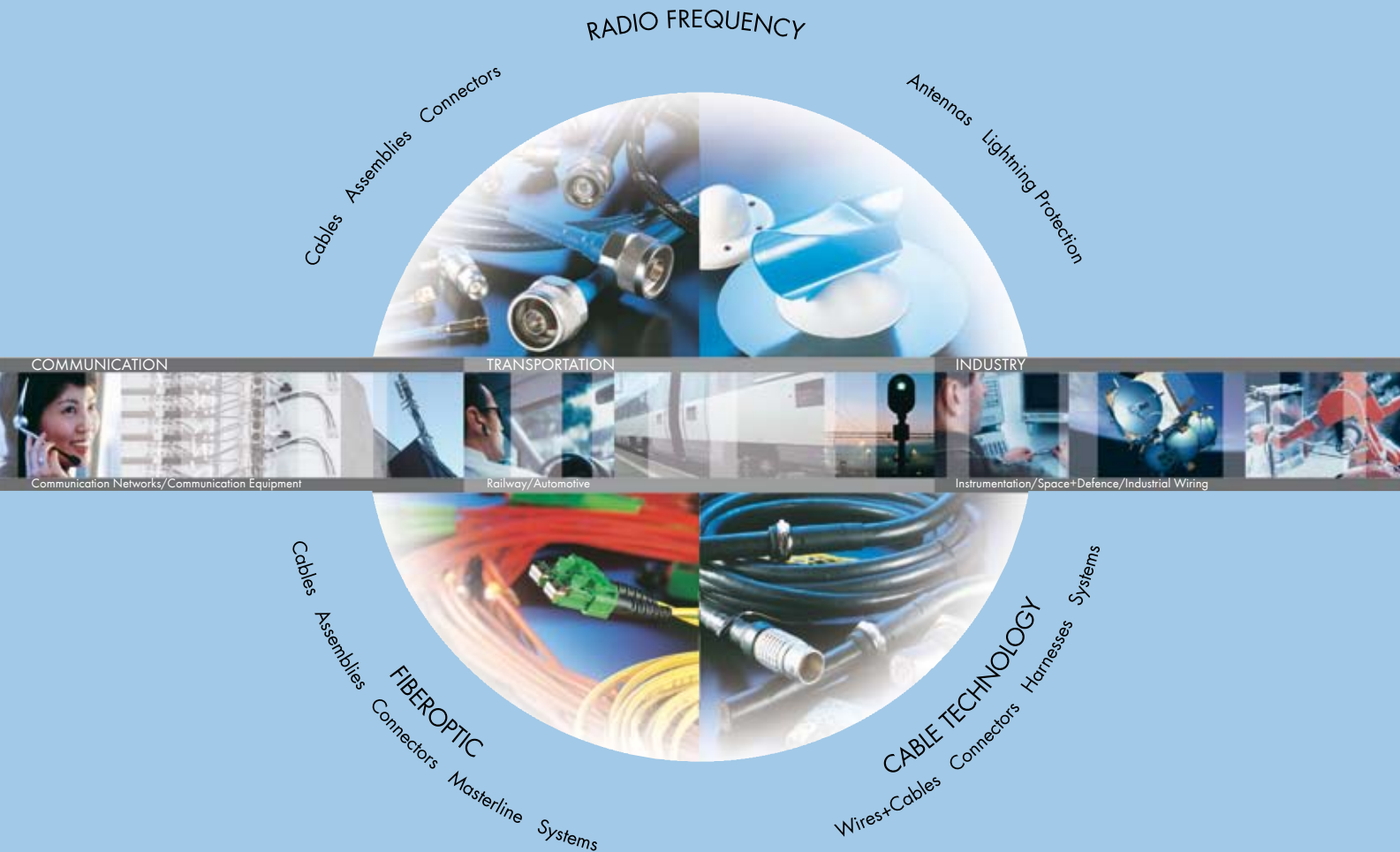
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RADIO FREQUENCY

Cables Assemblies Connectors

Antennas Lightning Protection

COMMUNICATION

TRANSPORTATION

INDUSTRY

Communication Networks/Communication Equipment

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Instrumentation/Space+Defence/Industrial Wiring

Cables Assemblies Connectors Masterline Systems

FIBEROPTIC

CABLE TECHNOLOGY

Wires+Cables Connectors Harnesses Systems

HUBER+SUHNER is certified according to ISO 9001 and ISO 14001.

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